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FEBRUARY
1934

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FLEET OWNER

THE FERGUSON PUBLISHING CO., 90 WEST ST., NEW YORK, N.Y.

Devoted to the Better Operation and Maintenance of Truck, Bus, Taxicab, Passenger Car and All Automotive Fleets

THIS MONTH'S FEATURES:

To Farm Out or Not?

•

Effecting Fleet Economies

•

Applying Preventive Maintenance

•

The Pros and Cons of Self-Maintenance

•

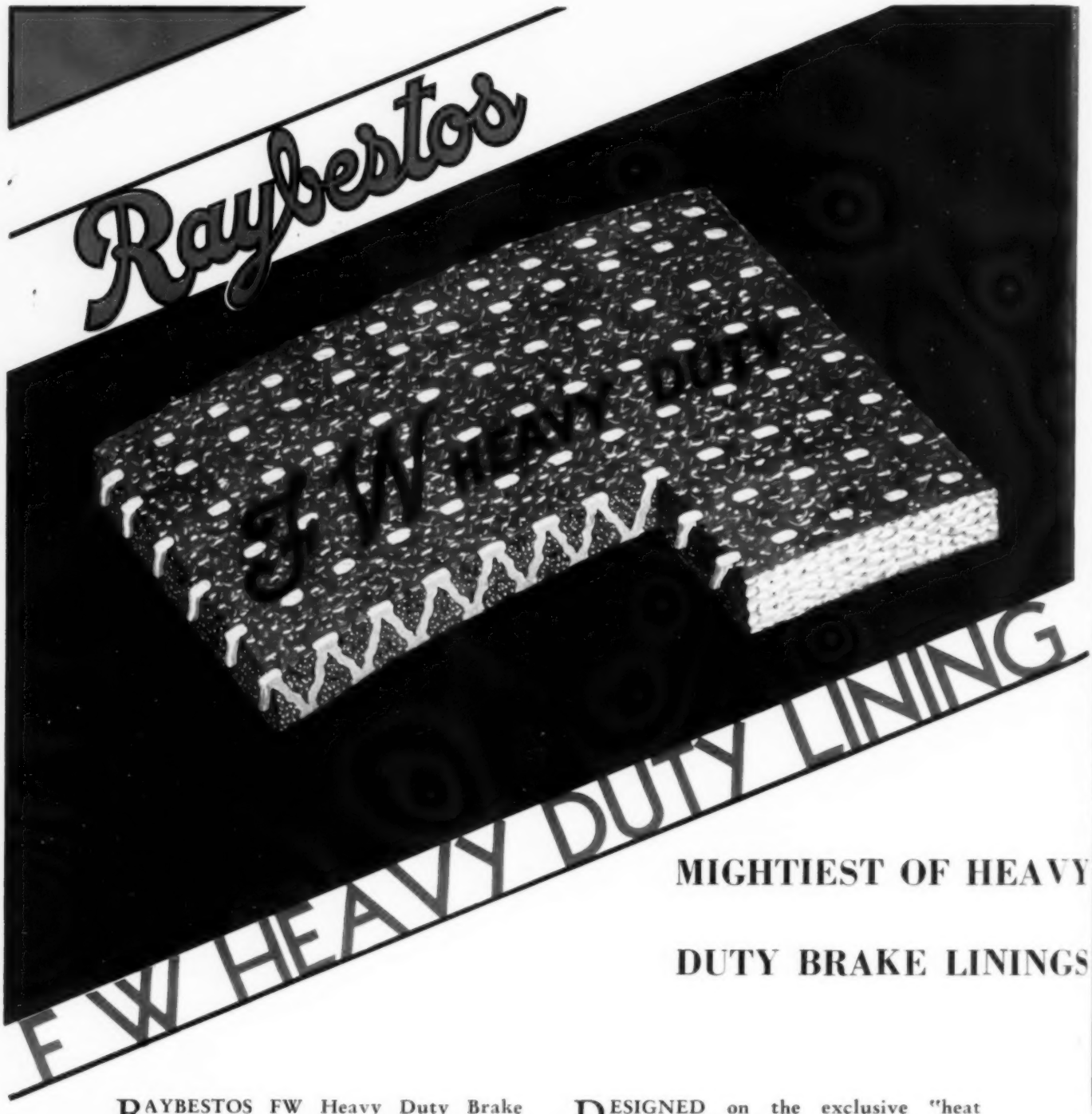
Package Delivery via Motorcycle

•

Servicing Cam & Lever Gears

•

Seven Departments



F W HEAVY DUTY LINING

MIGHTIEST OF HEAVY DUTY BRAKE LININGS

RAYBESTOS FW Heavy Duty Brake Lining is a brute for punishment - - the most powerful and efficient lining of its type ever developed. This lining easily withstands the shocks, strains and excessive wear of heavy duty service and for that reason assures utmost economy in costs for operating. Raybestos FW adds a factor of safety beyond price. Operators of heavy duty vehicles everywhere endorse and use Raybestos FW in preference to any similar brake lining.

DESIGNED on the exclusive "heat bridge" principle. Strands of large gauge plastic metal run through the lining from one side to the other. These strands are in direct contact with drum and lining surface at the same time. Heat radiates into shoe and adjacent parts which means longer wear and greater efficiency. During one process of manufacture, Raybestos FW is subjected to 2,500 pounds compression per square inch. Truly, the mightiest of heavy duty linings. Flexible. Delivered in rolls.

NRA
WE DO OUR PART

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONN.

UTILITY

FIRST TO INVENT
FIRST TO PERFECT
FIRST TO MARKET
IN THE UNITED STATES

Experience is the Best Teacher

UTILITY Six-Wheel Attachments

Have many practical advantages such as:

1. Truck frame supported at four points under load.
2. Drive wheel traction increased when accelerating.
3. Brake reaction equalized.
4. Maximum flexibility and simplicity.
5. No change in truck parts to install attachment.

The Utility design is fully protected by patents and the above advantages cannot be obtained with the single point suspension six-wheeler.

Utility Distributors Are Near You

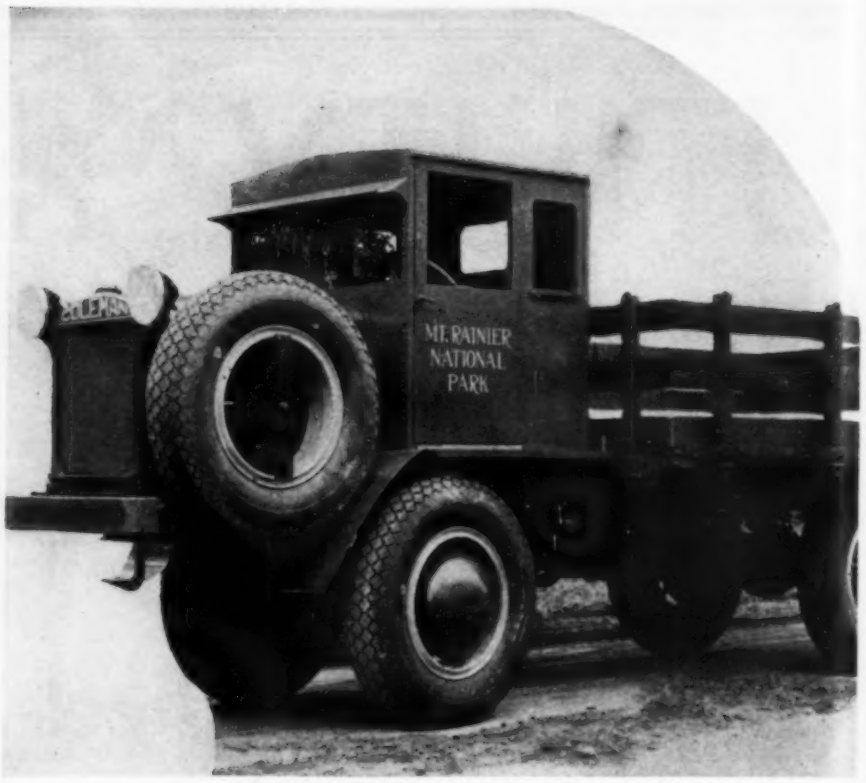
Buffalo...Frey, The Wheelman, Inc., 520 Ellicott St.
Cambridge..Perin-Walsh Company, Fifth & Bent Sts.
Chicago..Schukraft & Company, 1201 Washington Blvd.
Cleveland..Truck Engineering Corp., 1802 E. 38th St.
Council Bluffs .....Omaha Standard Body Corp. 2411 W. Broadway
El Paso .....Walter Pufahl, 620 Texas St.
Fresno .....Utility Trailer Sales Co., 630 "R" St.
Honolulu..Schuman Carriage Co., Box 2281, Honolulu
Indianapolis.....Indiana Wheel & Rim Co. 34 West North St.
Kansas City .....National Steel Products Co. 1611 Crystal Avenue
Los Angeles .....Utility Trailer Sales Co. 1600 So. San Pedro St.
New York City..Metropolitan Truck Equip. Corp. Long Island City, Third St. & West Ave.
Philadelphia .....United Wheel & Rim Service 1412 Fairmount Ave.
Phoenix .....The O. S. Stapley Co.
Portland .....Murry Jacobs Co., 146 N. Sixth St.
Richmond .....Baker Equipment Engineering Co. Summit & Rockbridge Sts.
Sacramento.Utility Trailer Sales Co., 440 No. 16th St.
Salt Lake City.The Lang Co., 267 West First South
San Francisco .....Utility Trailer Sales Co., 1242 Mission St.
Seattle...Murry Jacobs Co., 528 First Avenue South
Washington, D. C......Washington Equipment Corp. 1003 Wisconsin Ave., N.W.

UTILITY TRAILER MANUFACTURING COMPANY

BOX 1407, ARCADE ANNEX LOS ANGELES, CALIFORNIA

10 Years of Six-Wheel Attachment Manufacturing

SKF EQUIPPED
BUILT BY
COLEMAN
MOTORS
CORPORATION

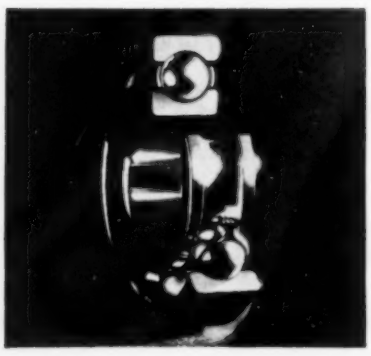


ALWAYS READY . . . SKF'S KEEP TRUCKS ▼ ▼ ▼ AVAILABLE

"All year round utility," says Coleman of this truck, and one of the things that contributes to this claim of availability is . . . SKF Bearings. Right in the heart of the truck, where tough going is apt to make serious demands on stand-up-ability, there you will find SKF's.

SKF Bearings are used in the front wheels and the auxiliary transmission of this job. In these locations, ruggedness, dependability and smooth performance are essential. SKF's meet every one of these adjustments and are always ready for the job. Service like this means real truck economy.

●You may buy a bearing as a bargain but try and get a bargain out of using it, for nothing is apt to cost so much as a bearing that cost so little



3125

SKF INDUSTRIES, INC., 40 EAST 34th STREET, NEW YORK, N. Y.

SKF
Ball and Roller Bearings

Reduce YOUR OPERATING COSTS WITH THE Firestone *Complete Line* OF EXTRA QUALITY PRODUCTS

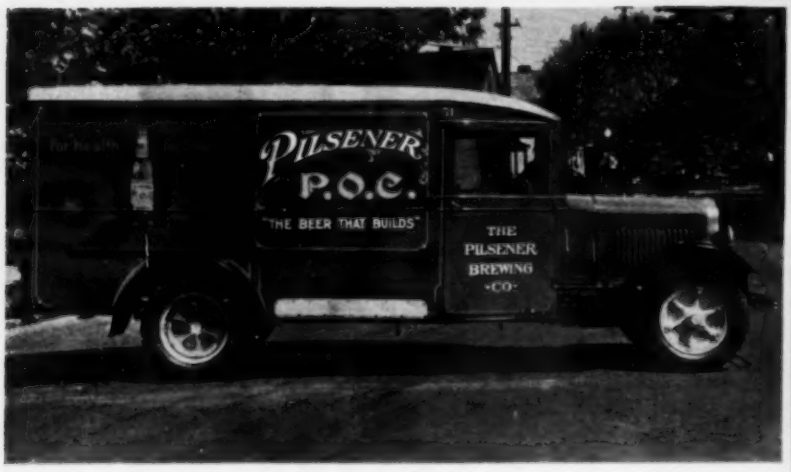
ROAD delays are costly. Avoid the unnecessary expense of premature tire failures—the risks of uneven inefficient brakes—the delays due to worn defective spark plugs, lack of power in your battery and the freezing of your radiator. Equip your fleet of trucks today with dependable Firestone Tires, Batteries, Spark Plugs, Brake Lining and Accessories, and lower your operating and maintenance costs.

For further economy let the Firestone Dealer or Firestone Service Store near your garage headquarters service your fleet. They will maintain the air pressure of your tires and inspect them for cuts and bruises, and will periodically test the batteries, spark plugs and brakes of your trucks to insure you uninterrupted daily performance. Let Firestone start serving you today and watch your operating costs go lower and lower.

Listen to the Voice of Firestone Every Monday Night Over N.B.C. —WEAF Nationwide Network.

Copyright, 1934, The Firestone Tire & Rubber Co.

KEM "DELIVERS THE GOODS" FOR BREWERS!



Sherwin-Williams Kem Transport Enamels lower maintenance cost and increase advertising value of brewery trucks

Again Sherwin Williams Kem Transport Enamels score with an important industry. Here are just a few of the many brewery trucks finished with the brighter, longer-lived colors of S-W Kem Transport Enamels. Brewers, like other alert fleet owners, are quick to appreciate the advantages offered by these new, chemically evolved finishes, *made especially for transportation equipment*. Briefly, these advantages are: (1) lower material cost—because of greater covering capacity; (2) lower labor cost—because of speed and ease of application; (3) trucks in the shop shorter time—more time in revenue producing service; (4) refinishing needed less often because S-W Kem Enamels wear longer.

Get This FREE Individual Finishing Specification Service

Sherwin-Williams finishing engineers will study your problems and work out individual finishing specifications for your trucks. This service will reduce to a minimum the number of days your trucks need to be in the shop for refinishing. Every day less cuts refinishing cost in halt. The chart shown here was made up especially for a Cleveland concern, at no cost to them. The same service is open to you. Write for details about it—no obligation. The Sherwin-Williams Company, Dep't. 623, Cleveland, Ohio.

MAJOR ADVANTAGES *S-W Kem Transport Enamels Offer You*

1. ECONOMICAL . . . Due to high solid content Kem Enamels cover solid in one coat even when reduced 33⅓% for spraying. High gloss *without* polishing.

2. EASY WORKING CHARACTERISTICS . . . Spray easily—level to uniform film. Can be brushed for reveals, belts, etc. Suited to wood, metal or composition surfaces. Can be applied over old finishes with minimum operations. Double coat sprayed continuously. Fast handling means trucks spend less time in the shop—more time on revenue-producing jobs.

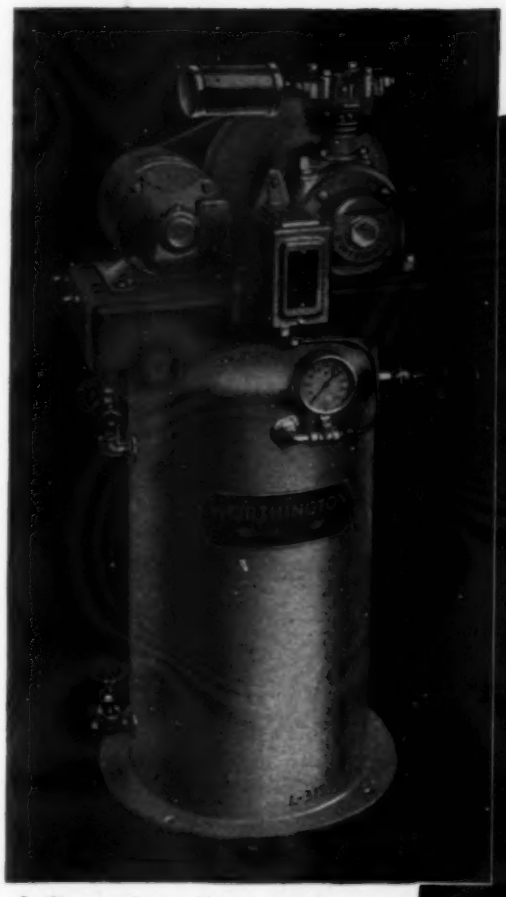
3. BETTER APPEARANCE . . . Porcelain-like finish is *easy to wash*. Uniform gloss in all colors.

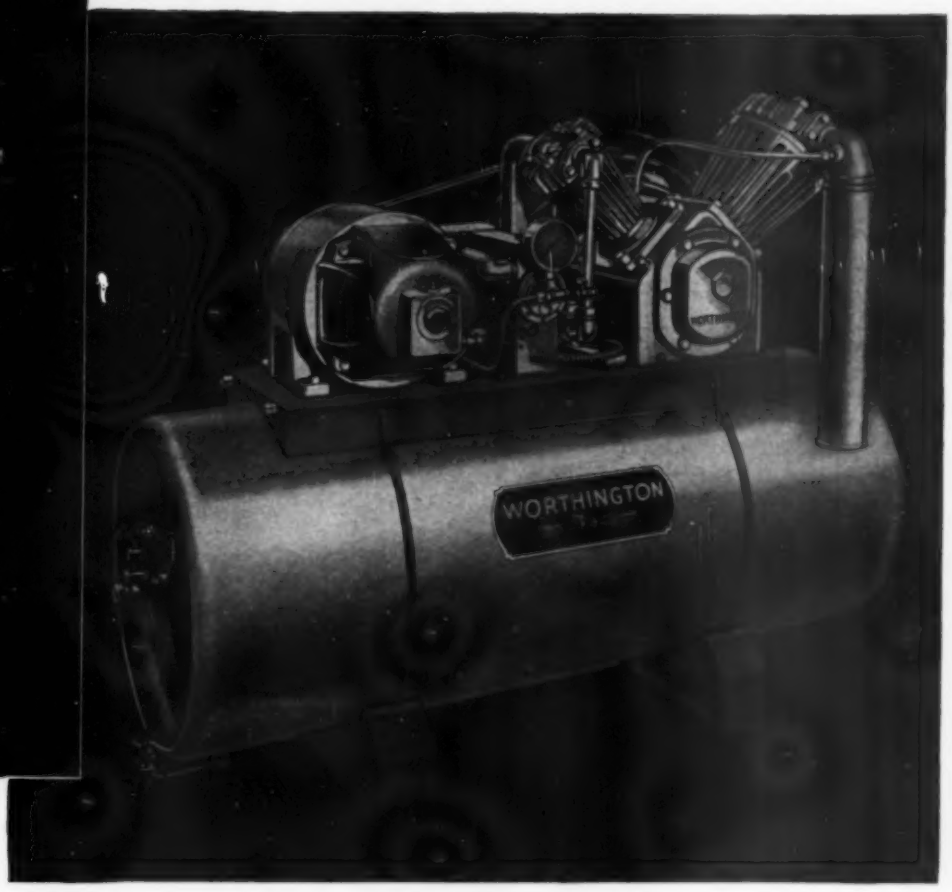
4. DURABILITY . . . Longest life for enamel finish. Refinishing needed less often. Fast to light colors. Excellent gloss retention on exposure. High resistance to wear and action of oil, gasoline, salt and alkali.

SHERWIN-WILLIAMS
KEM TRANSPORT ENAMELS

Say "I saw it in FLEET OWNER"—It Helps!

There must be A REASON...





A Complete Line

for every capacity requirement, and pressures up to 250 lb.

Equipped with
WORTHINGTON
MULTI-V-DRIVE
GOODYEAR
EXERACORD CORD BELTS

TO THE GARAGE, REPAIR SHOP, SERVICE STATION ... Worthington Compressors mean an adequate supply of air year in and year out... with minimum attention and at the lowest cost.

MORE than 35,000 Worthington Small Vertical *Feather Valve* Compressors have been purchased in the past ten years... by thousands of satisfied users in many fields.

This record of proven performance... plus over forty years of successful compressor building experience... is back of Worthington's present amplified and even further perfected line of complete tank-mounted automotive units.

WORTHINGTON PUMP AND MACHINERY CORPORATION

Works: Buffalo, N.Y. Harrison, N. J. Newark, N. J.

GENERAL OFFICES: HARRISON, NEW JERSEY

District Sales Offices and Representatives:

ATLANTA	CINCINNATI	DENVER	HOUSTON	NEW ORLEANS	PITTSBURGH	SAN FRANCISCO
BOSTON	CLEVELAND	DETROIT	KANSAS CITY	NEW YORK	ST. LOUIS	SEATTLE
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CHICAGO						WASHINGTON

Branch Offices or Representatives in Principal Cities of Foreign Countries A-3411

BUILT TO ONE QUALITY STANDARD ONLY . . . THE HIGHEST

WORTHINGTON

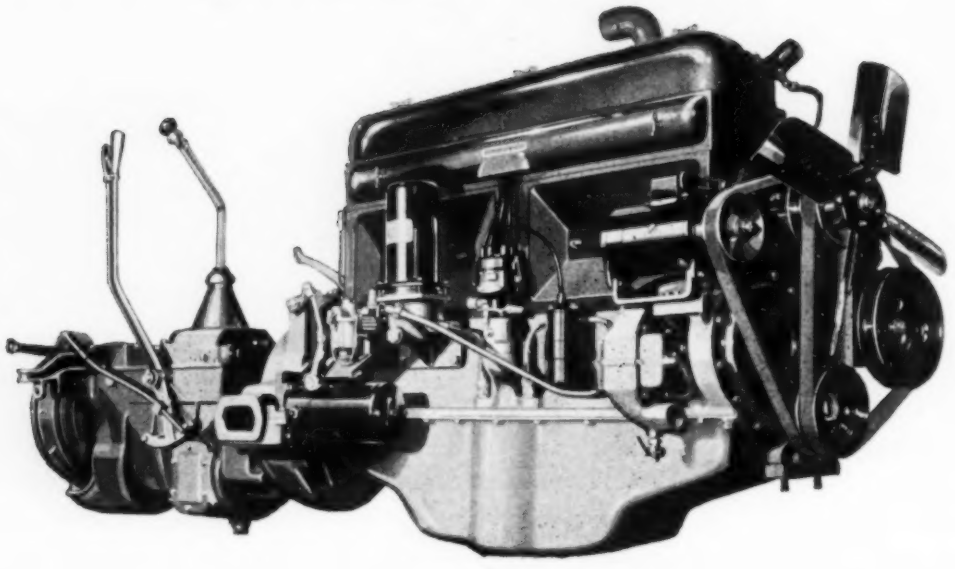
Say "I saw it in FLEET OWNER"—It Helps!

GENERAL MOTORS TRUCK COMPANY

presents

A NEW ENGINE

GMC 450



DEVELOPING the highest sustained torque of any truck engine in its capacity range . . . and delivering maximum torque from 800 to 1200 r.p.m. . . . the new GMC 450 engine fully maintains the reputation for capability which the GMC line has established. In spite of its 120 horsepower, developed at 2300 r.p.m., this new 450 is characterized by *high* operating economy.

Like its companions, the new GMC 450 power plant is of 6-cylinder valve-in-head GMC design. Its features and improvements include down-draft carburetion; crankcase ventilation; oil temperature regulator; full pressure lubrication; and airplane type, steel backed, copper lead alloy precision bearings.

The GMC 450 is designed for heavy duty service. Completely truck-engineered and truck-built, it is a worthy addition to the famous group of GMC truck engines.

CHECK THESE FEATURES OF VALUE—ECONOMY—DEPENDABILITY

1 The highest sustained torque in its capacity range—340 ft. lbs. at 800 to 1200 r.p.m.

2 120 horsepower at 2300 r.p.m.

3 GMC valve-in-head design—for greater power and efficiency.

4 Down-draft carburetion—for maximum torque over a wide speed range.

5 Roller bearing centrifugal water pump—front mounted to provide large generator space.

6 Crankcase ventilation—to maintain oil quality.

7 Oil temperature regulator—to protect bearings by keeping oil temperature at normal.

8 Full pressure bearing lubrication.

9 Tulip type exhaust valves, stellite seats.

10 Balanced and counterweighted four-bearing crankshaft.

GENERAL MOTORS TRUCKS and Trailers

GENERAL MOTORS TRUCK COMPANY — *Time Payments Available Through Our Own Y. M. A. C.* — PONTIAC, MICHIGAN

Say "I saw it in FLEET OWNER"—It Helps!

The

FLEET OWNER

Published Monthly in the interests of Automotive Fleet Owners who maintain their own Repair and Service Shops and devoted to the better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

VOL. 12 New York, February, 1934 No. 2

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Now ready

HOOF GOVERNOR *for the* NEW Dual Carburetor on the 1934 FORD V-8

Again Hoof Engineers are keeping pace with the very latest automotive engineering developments.

Dynamometer tested—road tested—correctly engineered for actual operating conditions, this new model S-1-D-2 Hoof Cantilever Spring Governor for the latest 1934 Ford V-8 with dual carburetor, will come to you with really proven performance. The Hoof Engineering Department—with its own 200 h.p. laboratory-type General Electric Dynamometer and other highly accurate special testing equipment, will always provide fleet owners with Hoof Governors giving the finest performance, with "power loss" completely eliminated. Precision workmanship—heretofore unknown in the governor industry—characterizes the entire line of Hoof Governors.

These New 1934 Ford V-8 governors are now ready for immediate shipments.

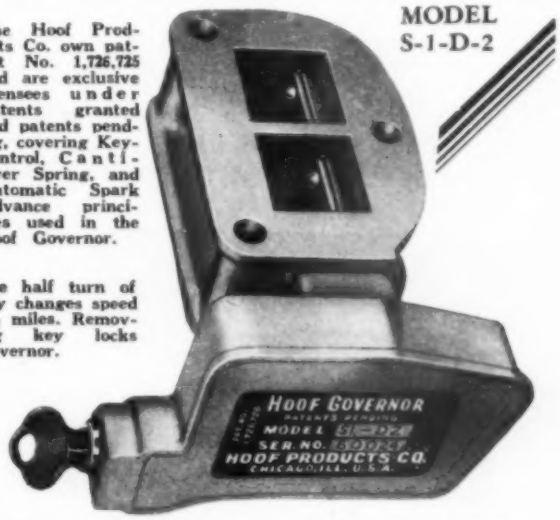
HOOF PRODUCTS CO.

166 NORTH FRANKLIN ST., CHICAGO

MODEL S-1-D-2

The Hoof Products Co. own patent No. 1,726,725 and are exclusive licensees under patents granted and patents pending, covering Key-Control, Cantilever Spring, and Automatic Spark Advance principles used in the Hoof Governor.

One half turn of key changes speed 2½ miles. Removing key locks Governor.



The HOOF

CANTILEVER SPRING

GOVERNOR

adopted as standard on the World's largest fleet

No Matter

What Size or Type Body

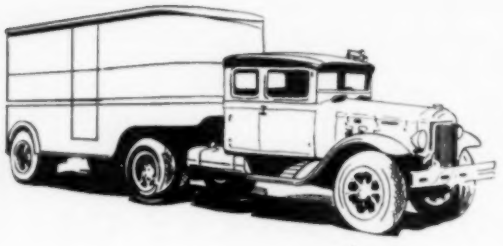
HASKELITE

PLYMETL

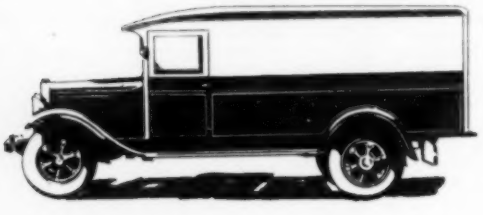
PHEMALOID

Will do the Job Best

For *buses*, Haskelite roofs, headlinings, interior trim, and Phemaloid floors are used by the leading manufacturers. They represent lightness, strength, and durability.



In large *trailer* and *van bodies*, Plymetl reduces dead weight to a minimum and increases loading space. Phemaloid floors and linings are also recommended for bodies of this type.



In light weight delivery units, Plymetl side panels are furnished in one piece eliminating unnecessary uprights and simplifying body construction. Here, too, Haskelite roofs and Phemaloid floors can be used to advantage.

It is an old axiom but it still holds good—the best materials make the best job. In Haskelite, Plymetl, and Phemaloid, we have provided you with a selection of panels unsurpassed by any on the market today.

Haskelite represents, without question, the finest plywood. It is a structural material which is readily moulded to any roof or headlining curvature; designed to your specifications.

Plymetl is the "lightest and strongest" body paneling. Its steel faces are purchased at a premium, yet Plymetl is no higher in price than similar panels.

Phemaloid Compound Lumber is the only plywood commercially available in large sizes that is glued with a resin adhesive immune to moisture and bacteria growth, the principal causes of rot. Phemaloid is superior to any of the commercial plywoods now used for truck and bus flooring.

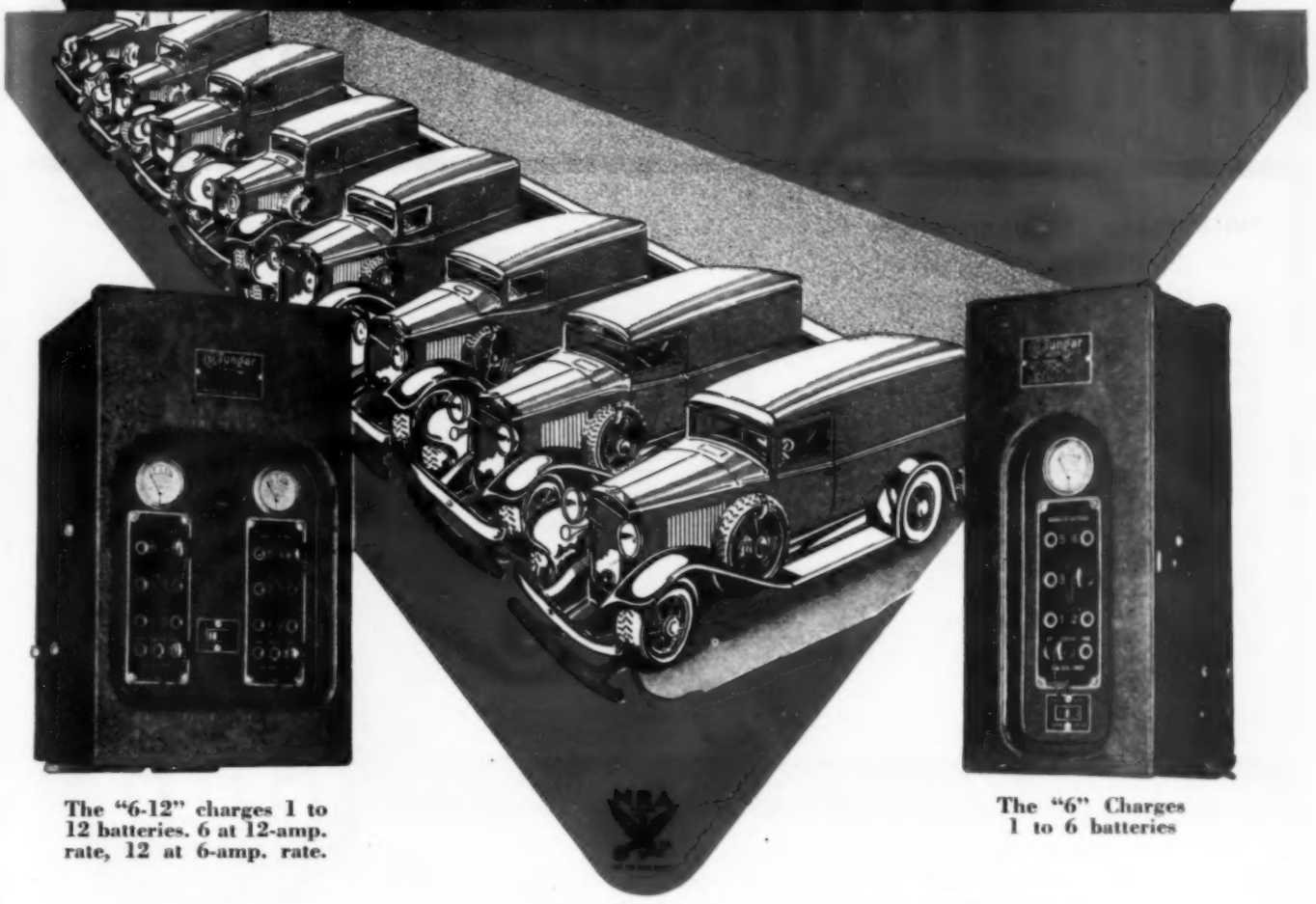
When you specify Haskelite products you specify panels which produce the finest type of job.

HASKELITE MANUFACTURING CORPORATION

208 WEST WASHINGTON STREET, CHICAGO ILLINOIS.

Say "I saw it in FLEET OWNER"—It Helps!

A TUNGAR BATTERY CHARGER
ELIMINATES RUN-DOWN BATTERIES



The "6-12" charges 1 to 12 batteries. 6 at 12-amp. rate, 12 at 6-amp. rate.

The "6" Charges 1 to 6 batteries

For over 17 years General Electric Tungar Battery Chargers have been used by many fleet owners to keep trucks, buses and cars on the road producing profits. There is no reason why any unit of your fleet should be tied up because of battery trouble.

Any one of the Tungar models from the "6" to the large "12-24" is equally easy to operate. Safe — because they are protected against line failure. Economical — because the charge tapers off as the batteries become fully charged.

Use a Tungar Battery Charger to help reduce maintenance costs by increasing the life of the batteries. It will soon pay for itself. A Tungar is one of the most inexpensive and valuable additions that can be made to your service equipment. For further information, write Section A-222, Merchandise Department, General Electric Company, Bridgeport, Conn.

FOR BEST RESULTS USE GENUINE TUNGAR BULBS

GENERAL ELECTRIC

AUTOMOTIVE PRODUCTS

MERCHANDISE DEPARTMENT. GENERAL ELECTRIC COMPANY. BRIDGEPORT. CONNECTICUT

Say "I saw it in FLEET OWNER"—It Helps!

REO GIVES YOU MORE TRUCK PER DOLLAR

With These 15 Superiorities Reo Challenges the Field for Low Cost Truck Performance

1-Highest Quality at Low Prices
2-Sturdy Frame
3-6 cyl. Gold Crown Engine—maximum torque at usable road speeds, instead of unusable horsepower available only at impractical road speeds.
4-Counterweighted Crankshaft
5-7 Main Bearings—Large Area
6-Full Pressure Lubrication
7-Full Floating, Steel Housing Axle
8-2 Speed Gasoline-Saving Axle Unit
9-Hydraulic Brakes
10-Large Brake Area
11-Long Springs
12-Cam and Lever Steering
13-Unusual Payload Capacity
14-Exceptional Loading Space, Properly Balanced
15-Advanced Selling Methods, Based on Ability Rating and Slide Rule

★

Illustrated—the 1½-2½ ton Reo Speedwagon

THE QUALITY TRUCK IN THE LOW PRICE FIELD

$595
1½-2½ TON CHASSIS
F. O. B. LANSING PLUS TAX
DUAL WHEELS EXTRA

REO has been in business long enough to know that a truck should be a truck—not a mere assembly of passenger car parts.

Check the present line of Reo Trucks and Speedwagons against anything in the market. You'll find Reo uses *Gold Crown* Engines—Engines that deliver *real truck performance.* You'll find truck frames, truck axles, truck transmissions, truck tires, truck brakes.

Trucks all the way through—built of materials carefully selected for better wear and longer life.

Trucks that are rated for power in terms of *torque* at usable highway speeds—instead of unusable horsepower available only at impractical road speeds.

New low prices are now in effect—and Reo today actually gives you even more truck per dollar than ever before!

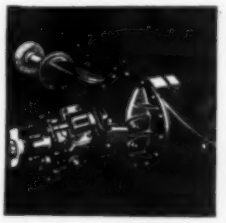
Never have Reo Trucks and Speedwagons been so perfectly balanced for exceptional service in ALL phases of hauling. There are not simply one or two outstanding features in a Reo—*fifteen major features* that PROVE its all-round superiority!

Certainly it is unnecessary to pay more than the price of a Reo. And, in the opinion of many a shrewd buyer—unwise to pay less!

Reo Speedwagons and Trucks range from 1½ to 6 tons. Price range—$595-$2,595. 34 wheelbases, 6's-8's. Tractor-Trailer units from 15,000 to 32,000 pounds, gross. All prices chassis f. o. b. Lansing, plus tax.

WRITE today for illustrated booklet of comparative specifications and details of the 15 reasons why Reo challenges the field for low cost truck performance.

TRUCK BUYERS—ATTENTION!



The new Reo built gasoline-saving two-speed rear axle unit gives you the equivalent of two motor sizes. Greater flexibility and economy for all types of work. Available at only slight extra cost.

The Reo Truck Performance Gauge gives the exact answer as to the truck best suited for your job. Before buying a truck, ask a Reo salesman to use this Gauge in determining your particular requirements.

REO MOTOR CAR COMPANY LANSING, MICHIGAN

Say "I saw it in FLEET OWNER"—It Helps!

VOL. 12
NO. 2

The FLEET OWNER

FEB.
1934

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF TRUCK, TRAILER, BUS, TAXICAB, PASSENGER CAR, AND ALL AUTOMOTIVE FLEETS.

Stripping *the* Thread » »

(The Editor's Column)

Breathes there a man with soul so dead,
Who never unto himself hath said,
When on a bolt, he stripped the thread:
"[illegible]"

YOU BE THE JUDGE

● That debate, held by the Automotive Service Association of New York, which we mentioned on this page last month, has finally been abstracted for publication. You'll find the "meat" of both sides of the controversy on pages 24 and 25 of this issue. Place all of this "meat" into a large pot, add a couple of dashes of your own experiences in self-maintenance vs. farming out, let it boil into a concentrate, and then (Campbellically speaking) add water and serve. We've presented the main arguments without rebuttals. Here and there, in forthcoming issues, we'll try to squeeze in a paragraph or two covering the salient points of other speakers on the subject. And you're going to be the judge as to whether or not self-maintenance of *your* fleet assures maximum service efficiency. But, as one speaker put it, don't ask Mike, your shop foreman, because his answer will not be unbiased—he'll be thinking of the wife and kiddies at home and will urge you to struggle along with the shop.

●

ONE IN OUR MIDST

● A prominent member of the Society of Automotive Engineers expressed a regret to us the other day, that there was no association or club of fleet maintenance men, that is, on a *national* basis. That's true, of course, and probably because our grand old United States is such a *big* country, which makes such a national organization physically impracticable. We pointed out to him, however, that there *is* a great brotherhood of fleet operators, and that it exists in a more or less unofficial form. We refer to the 18,000 fleet executives who receive and read this publication each month. Our Question-of-the-Month Club is perhaps the board of directors—at least it could be called the "active" chapter of the brotherhood. Since there are no dues, no assessments, no meetings to attend and no obligations of any kind, it is hoped that "membership" in this "club" will increase during 1934. Five minutes' work each month in filling out the questionnaire (see page 39 of this issue) is all that's required. And the benefits? No fancy buttons to wear, but a comprehensive, typewritten tabulation of fleet maintenance experience is mailed to each member each month, covering different subjects. And your copy of FLEET OWNER, too, last but not least. Won't you help swell the ranks this year? We do all of the secretarial work—and you get the benefit.

●

CHECK

● An advertisement, elsewhere in this issue, contains some interesting material that can rightfully be construed as an analysis of you and your job. We quote from it: *"Each fleet needs an executive who can analyze the complicated problems of cost accounting, taxation, personnel and sales cooperation. He must be familiar with the latest practice in operation and maintenance, including the modern high components of today's transportation requirements. If your financial statement shows a deficit and your truck deliveries are causing part of it, you need a man who can cut your truck costs to a minimum."* To which we say "Check and Double Check." For the day is long past when a mechanic could supervise a fleet costing thousands of dollars. But there's nothing to prevent a good fleet manager from graduating out of the mechanic-stage, as many of our foremost superintendents have done. And, as one executive delights in saying, "A college diploma is not necessarily proof of a good education." Why not tear out this paragraph, paste it in your hat and use it as a basis for sizing up? There's lots of truth in it, we think.

●

POINTED PARAGRAPH

● Here's one for the book: *"The man best versed in any particular line is the man who has at his finger tips the greatest amount of information obtained through the experience of the other fellow."* We didn't invent this one; it is extracted from a letter received from a prominent fleet executive who apparently appreciates *his* publication. In the last analysis, isn't that just exactly what you get in the reading columns of FLEET OWNER? Thanks, very much, Mr. W.

●

WHAT'S IN A NAME?

● If a firm operating ten or more automotive vehicles is called a "fleet owner", what would you call a firm operating ten or more motor-boats? We recently had a telephone call from a Scandinavian fish-monger, operating out of the Port of New York with 16 small fishing boats. He said that he had glanced at our front cover and saw the words "FLEET OWNER" and immediately claimed relationship, inasmuch as he "owned a fleet". Since he did not have an opportunity of perusing the publication, he was much disappointed when we told him that we do not cater to motor boat fleet owners. What's in a name, anyway? There's an idea, perhaps, for the new-publication starters. They're very numerous now, we understand.

●

H. Clay Fischer
Editor

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By L. V. Newton,
Byllesby Engineering & Management Corp., Chicago, Ill.

Effecting Economies *in the* Fleet

Article V: Accident Prevention • Some of the Steps We Have Taken to Reduce Fleet Accidents and What Has Been Accomplished

TRAFFIC accidents have long been accepted rather apathetically, both by industry and by the general public, as being the result of causes beyond human control.

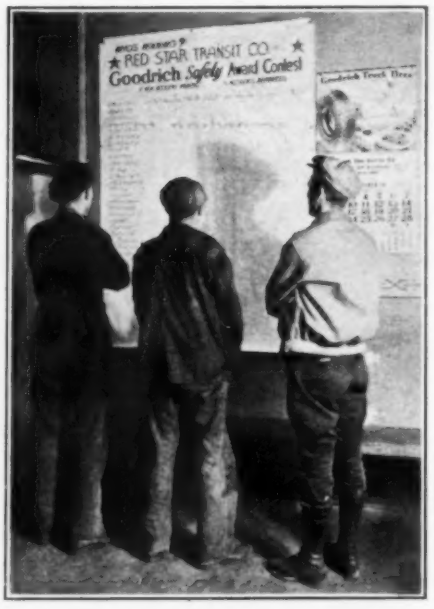
For some years our companies have been maintaining a high standard of maintenance on our transportation equipment. Brakes, lights, horns, steering gears, etc., have been examined carefully at each inspection period with accident prevention in mind, the greatest care being taken so that mechanical failures of the vehicles would not occur and possibly be responsible for accidents.

Rear view mirrors, reflector lights, stop signals and direction indicators have been installed on our vehicles in our efforts to prevent accidents.

Up to 1929, accidents failed to decrease in most of our companies to any material degree. Our accident records as a whole were not bad, some could even be called satisfactory—yet there was room for much improvement.

After a study of our accidents, it was plainly shown that mechanical defects in the vehicles played a minor part. We found as the Travellers Insurance Company did, that most accidents occurred when all mechanical conditions, time, road and weather conditions were in the driver's favor. The real causes for the accidents were driver's inattention—driving too fast, failure to observe rules of the road—and neglect of the rules of common courtesy.

In one of our companies operating 411 motor vehicles which 980 different employees drove in the course of their work, the accident records were studied as far back as Jan. 1, 1927, and it was found that about 18% of the drivers had more than 60% of the accidents.



"A Code of Safe Driving Practices published and distributed among our companies has materially reduced accidents." (Here is how the Red Star Transit Company of Akron, Ohio, keeps a day-by-day record of their drivers' safety progress, as they strive for the Silvertown Safety League awards.—Editor.)

A code of Safe Driving Practices was published and distributed in 1931 and subsequently it was decided to subject all employees who drove vehicles to vision and hearing tests. Twenty were found with defective vision and correction was made by the fitting of glasses.

Permit cards were then issued to all employees having occasion to drive the company's vehicles. To those having had an accident within the past year, white cards were issued; to those having operated vehicles more than one year without an accident, red or Honor Cards were issued; those having two years to their credit without an accident received blue Honor Cards.

Needless to say, all employees prize their Honor Cards and guard against accidents because if they have one and if the traffic accident committee places the blame for an accident on them, the honor card is taken up and a white card is issued unless more rigid discipline is prescribed.

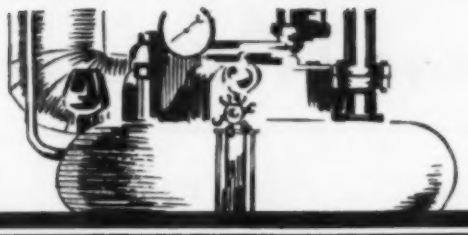
Now to show what has been accomplished in this company, let me cite the following:

In 1931—417 vehicles were operated 4,472,976 miles with 105 accidents, a frequency rate of 1-12 accidents per 100,000 miles. The public utilities rate during this period was 2.51.

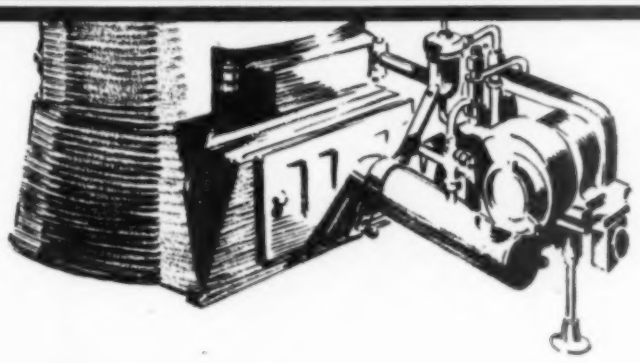
During the first 5 months of 1933—387 vehicles have been operated 1,621,082 miles with 17 accidents, a frequency rate of 1.05 accidents per 100,000 miles. The public utilities average for the same period is 2.08.

This experience gained in one of our companies is a good indication of just what can be accomplished if accident prevention work is gone into seriously—needless to say, transportation costs have been reduced, through the elimination of repairs made necessary to our vehicles by accidents.

Accidents also depend to a great extent on the physical or mechanical condition of the vehicles, in which inspection plays a major part. After considering various inspection plans and reports, it would appear that the most desirable plan is to perform a major inspection every 90 days (2,500 to 3,000 miles), with light intermediate inspections every 30 days, or every 1,000 miles. For the major inspection a detailed inspection report is necessary. For the minor inspection a less detailed report is necessary, the essential items being checking of distributor points, spark plugs, gasoline strainer, brake adjustment, lights, horn, windshield wiper, etc. Lubrication is also cared for at this time, as well as thorough washing and cleaning of the vehicle if time permits. Insofar as possible, oil changes and lubrication of the vehicles should be tied in with the inspection plan. It may be necessary, however, that vehicles be lubricated in between inspection periods. Inspection on a time basis is most desirable from many angles.



"What's This Furnace Got to Do with My Trucks?" PLENTY!



If yours is a modern heating plant, it has thermostatic control, which sends up more heat into your house when the outside temperature is falling—and automatically shuts off the heat when the temperature climbs.

If your trucks or buses could have some such system to control the amount of current flowing into the batteries, what a lot of trouble and expense you could save yourself!

Never again—with such control—would your batteries be persistently overcharged—causing the water in the battery to boil—the plates to buckle—the separators to deteriorate—the battery to be ruined.

Never again—with such control—would your batteries be habitually undercharged, causing plates to become sulphated, reducing the capacity of the battery until eventually it takes no charge at all and is ruined.

And now such control is a reality—with the Bosch Volt-O-matic Generator, which automatically regulates the supply of current produced, according to the needs of the battery.

The Bosch Volt-O-matic Generator operates in much the same way as the control on your heating plant...putting a heavy charge into your battery when the drain is heavy; automatically and gradually cutting down the current supply as the battery becomes charged. Thus the battery is so well protected from abuse that road breakdowns are prevented; battery repairs and replacements are minimized and you're always sure of a powerful starting spark.

And here's equally important news: The Bosch Volt-O-matic Generator is deliberately designed so that when the engine is running, the generator itself and *not the battery*, carries the load of all current consumers. Result: Still greater savings in maintenance costs. You can use a smaller sized, hence lower priced battery. Your lamps cannot burn out from sudden excessive voltage, nor blow out from broken wires or corrosion of battery terminals.

Dollars You Can Save

Ask your Bosch service station to show you the facts contained in our new book, illustrated here. It proves how Bosch Volt-O-matic Generators can save you money... keep your trucks and buses on schedule... lower your operating cost-per-mile. Ask, too, about the new low prices both on heavy duty and lighter duty Bosch Generators. Or mail coupon below, direct to us for full information.

UNITED AMERICAN BOSCH CORPORATION
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PRODUCTS manufactured by ROBERT BOSCH A. G., bear trademarkshownabove. Sold by United American Bosch Corporation.

PRODUCTS OF ROBERT BOSCH A. G.

- ☐ Bosch Volt-O-matic Generators
- ☐ Bosch Pyro-Action Spark Plugs
- ☐ Bosch Rapid Transit Magnetos
- ☐ Bosch Ditch & Fog Light
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- American-Bosch Big Brute Coil ☐
- American-Bosch Condensers ☐
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- American-Bosch Magnetos ☐
- American-Bosch Car-Radio (25) ☐

PRODUCTS manufactured by the UNITED AMERICAN BOSCH CORP., bear the trademark shown above.

WRITE NAME AND ADDRESS IN SPACE BELOW

Say "I saw it in FLEET OWNER"—It Helps!

How Preventive Maintenance Cut Our Costs

Simple System, With but Few Forms, Reveals Inefficiency of Shop and Cuts Fleet Costs One Cent Per Mile

By Dwight H. Woods,

Engineering Asst., Nashville Gas & Heating Co., Nashville, Tenn.

HAVING read of other operators' maintenance experiences in this publication, I am glad to supply you with the following information covering the operation and maintenance of our fleet.

We have been using a system of Preventive Maintenance since April, 1932, on all of our motor vehicle equipment and have found it very satisfactory. At that time, we abolished our own repair shop and decided to send our cars and trucks out for repairs, to the dealers handling each make of vehicle.

The two forms illustrated on this page are backed up on a single sheet. This sheet is supplied to all the dealers' service stations doing our maintenance work.

The writer keeps track of the work done, as all orders for repairs and inspections are made out by him. All bills, likewise, come back to this department and all of the information desired to be recorded is entered on a 5" x 8" repair card and of our own design; which cards are kept in a Remington-Rand Visible File.

This repair card contains records of crankcase, transmission and rear-end oil changes, chassis greasings, gasoline consumption, brake relinings, valve and carbon jobs and cylinder reconditioning work. On the reverse side of the repair sheet there is provision for recording all other major repair work, together with the date and the speedometer reading. One card serves for each truck.

The bills then go through the regular accounting department and at the end of each month we get a complete cost on each vehicle for the month. From this cost record we can work out the cost per mile for each piece of equipment, and finally a complete cost per mile for the entire fleet.

We have found that this latter card system, which has been in use since May, 1931, has given us a much better idea of what to expect from new equipment to be purchased, and that it has cut the cost of operation and maintenance somewhat.

It also has showed up the apparent inefficiency of our own shop and has led to the farming out of the fleet repair work and the adoption of the Preventive Maintenance policy. Getting down to figures, it has cut the cost of operation on our fleet over one cent per mile less for the eleven months of 1933, than for the same period of 1932.

(Editor's Note: The Preventive Maintenance system referred to above—not the cost-keeping system—was described in detail in our August, 1933 issue. It is the same one as sponsored by the General Motors Truck Company, Pontiac, Mich., who will be glad to send further details on request.)

PREVENTIVE MAINTENANCE SERVICE

TRUCK No. _____ MILEAGE _____ DATE _____

This Report is to be made every 1000 miles or periods not to exceed 30 days.

√ — If OK X — Adjustment Made O — Repairs Needed

Check Here		Check Here	
	ENGINE		**REAR END**
	1. Tighten cylinder head bolts.		25. Inspect rear axle for backlash.
	2. Adjust spark plugs to .025.		26. Tighten axle shaft nuts and inspect for end play.
	3. Oil fan, examine belt adjustment.		27. Inspect for grease leaks.
	4. Oil generator, starter, distributor.		28. Tighten spring clips and adjust shackles.
	5. Clean and adjust distributor points and check timing.		29. Inspect torque tube, propeller shaft and universal joints.
	6. Tighten intake and exhaust manifold.		**GENERAL**
	7. Adjust valves to proper clearance.		30. Check clutch pedal clearance to toe board.
	8. Inspect ignition wires.		31. Check clutch for dragging and slipping.
	9. Check carburetor and adjust.		32. Test and focus lights, test horn and windshield wiper.
	10. Tighten motor support bolts.		33. Fill battery with distilled water, clean and tighten connections.
	COOLING SYSTEM		34. Test instruments on dash.
	11. Fill radiator before testing system.		**WHEELS AND BRAKES**
	12. Inspect and tighten hose connections.		35. Tighten rim lugs, test for trueness.
	13. Tighten water pump gland nut.		36. Check brake linkage for looseness; oil all connections with penetrating oil, check lining and adjust brakes.
	14. Inspect cooling system for leaks.		**BODY**
	15. Tighten radiator tie rods.		37. Tighten sheet metal parts and body bolts, inspect and tighten body hardware.
	16. Tighten radiator hold down bolts.		**LUBRICATION**
	FRONT END		38. Grease chassis thoroughly.
	17. Test play in knuckle bolts and wheel bearings.		39. Check lubricant in rear axle and transmission and bring to level.
	18. Test front wheels for correct caster, camber, and toe-in.		40. Check engine oil, change or bring to level.
	19. Inspect and tighten steering arms.		
	20. Inspect and adjust tie-rod and drag link.		
	21. Tighten spring clips and adjust shackles.		
	STEERING		
	22. Tighten steering housing to frame.		
	23. Tighten pitman arm.		
	24. Adjust play in steering.		

AFTER ABOVE WORK IS COMPLETED, ROAD TEST TRUCK O. K. _____ (Signature)

Time taken for above _____ _____ Mechanic

Note — Items marked O, needing repairs, are to be listed on other side with explanation.

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WORK ORDER

Item No.	DESCRIPTION OF WORK TO BE DONE	Time Required	Work Done By
	Total Hours Applied		

Part No.	PARTS USED	Price

Work Completed _____ Date

SIGNED _____ Sup.

Cost Record: Total Parts Cost _____ Labor Cost _____ Total Cost _____

Above is shown both the front and back of the form used in Preventive Maintenance work.

"We consider POWER PROVER SERVICE indispensable"

...writes Val Decker Packing Company of Piqua, Ohio...operators of a 64-truck fleet

THE well-known and progressive meat packers . . . The Val Decker Packing Company . . . have found the one sure, reasonable method of keeping its 64-truck fleet in prime condition. They have made POWER PROVER Service an established feature of their maintenance operation. And this fine fleet which travels 100,000 miles monthly is now being operated on a more economical basis and is producing more power and better road performance than ever before. In their own words they "consider POWER PROVER Service indispensable."

To date, POWER PROVER Service has been adopted by more than 4000 fleet operators in all lines of business who report the following varied benefits: savings on gasolene and oil—frequently as much as 30%; lengthening of the interval between overhauls; reduction of dangerous exhaust gas fumes; and a material improvement in starting, power and other phases of road performance.

POWER PROVER Service is the one practical and sure way of cutting fleet operating costs. This service covers three distinct steps—an analysis of the exhaust gases, a comprehensive 23-step tuning routine, and the use of exclusive, patented Cities Service tuning tools.

This money-saving service is available to you at small cost... about one cent per day per vehicle.

We shall be glad to demonstrate on your own equipment and with your own mechanics just what the POWER PROVER can do for you.

Start saving money and get better engine performance at once. Write Cities Service POWER PROVER, Room 702, 60 Wall Street, New York City, New York.

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ONCE - ALWAYS

Radio Concerts—Fridays at 8:00 P. M., E. S. T., over WEAF and thirty-three N. B. C. stations

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Say "I saw it in FLEET OWNER"—It Helps!

Motorcycle Dealer Turns Fleet Operator

Use of Motorcycles for Small Package Deliveries Finds Increasing Favor Among Firms Requiring Inexpensive Metropolitan Service

By Geo. W. Sutton, Jr.

INGENUITY displayed by the "Six Stern Brothers" in New York City, in using motorcycles for small package deliveries has solved at least two major problems that confronted them a year ago. At that time they were simply dealers in motorcycles and their accessories, although the largest company in this category in the city.

First there was unemployment all around them; next, the depression had put a dent in their sales. Then the big idea came to the Six Stern Brothers. They inaugurated a delivery service for small packages of all kinds and descriptions, from a half barrel of beer to a package of needles, and started out to sell the service to those who needed it. The Indian Motocycle Company had designed and built several chasses to be attached to the rear of their motorcycles that provided for two wheels in the rear and upon these chasses was mounted an enclosed body large enough to hold hundreds of small packages.

The Six Stern Brothers started in this line of endeavor by offering the service to big department and chain stores. It provided for delivery service of any and all kinds that could be handled on these small motorcycle trucks. The Sterns announced that they would serve the client in full or in part, for a week, a month, or a year or longer.

The idea was that the Six Stern Brothers would furnish the motorcycle truck with a driver and a uniformed attendant. The latter wears a neat uniform which identifies him with the client, if desired. This entire equipment was offered as a service, both the driver and the attendant remaining on the payroll of the Six Stern Brothers.

At present they are serving 63 clients with 87 motorcycles, drivers and attendants and are enlarging their equipment to provide for 100 clients with 150 machines manned by 300 men. Their present clients include such firms as Woolworth's, Bloomingdale's, Abraham & Straus, New York Daily News, Horton's Brewery, Emerson Radio, Peter Doelger Brewery and 56 others and all of these receive daily service.

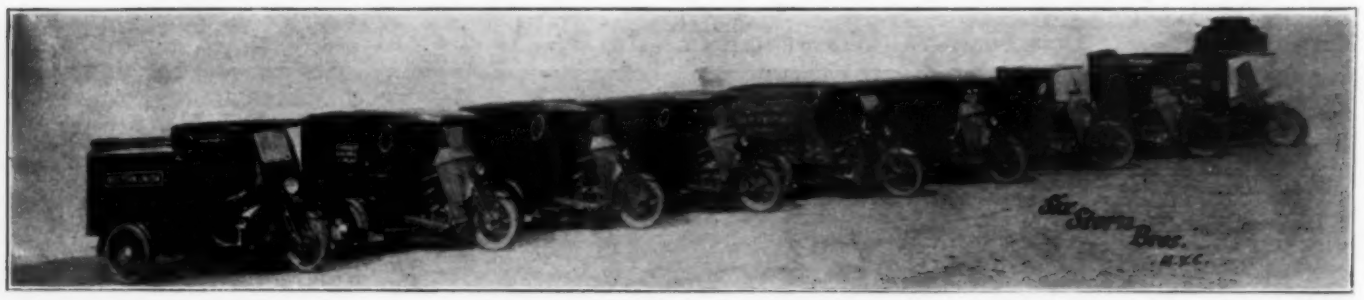
Their latest as well as their largest proposition is being tried out by the Great Atlantic and Pacific Tea Company. This great chain is now using the Stern Motorcycle Service at a large number of its stores in Greater New York and are contemplating contracting with the Six Stern Brothers to service their entire 7,000 stores in and around New York City, it is understood.

Thus the Stern Brothers have made a profitable venture of this small package delivery and at the same time have given daily employment to about 175 men. Owing to a combination of favorable circumstances the Stern Brothers believe they can service one firm or a hundred firms with one or a hundred motorcycles, drivers and attendants at a lower cost than the clients could buy the machines and equip and operate them themselves. When inaugurating this service they knew they could furnish both quantity and quality in their service and yet derive a substantial profit.

To begin with, they know that motorcycles are less expensive as to original cost and upkeep than automobiles. Secondly, being established Indian dealers they are enabled to buy their motorcycles at a discount from the Indian Motocycle Company. These two favorable factors permit them to quote a far lower price than the client could obtain otherwise and, maintaining a complete mechanical department, they can render expert service that would be hard to surpass in efficiency.

While many of their motorcycles are in use day and night, the main squad leaves the Six Stern Brothers' plant promptly at 7.30 o'clock each morning, ex-

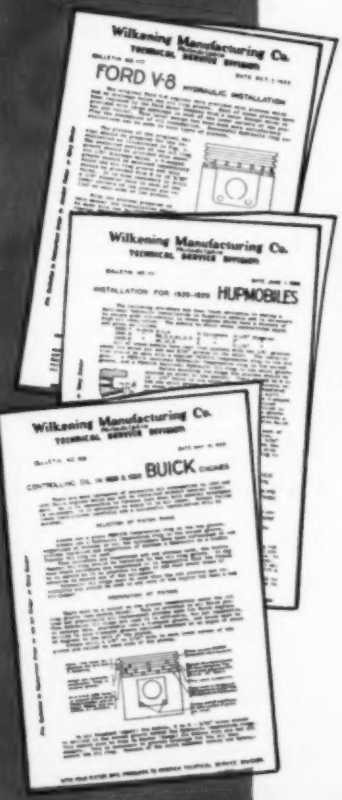
(Please turn to page 41)



The Pedrick Technical Service

This manual covers passenger car field in general

Special bulletins issued from time to time cover special cases



Showing how to select and install easily the correct ring for every job

Wilkening Manufacturing Co.
Philadelphia, Pa.

Dear Sirs: Please tell me how I may obtain regularly the PEDRICK Technical Service.

Name.....

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Mail coupon today for complete information

To render the most expert possible piston ring service, two things are necessary. They are:

1. Dependable knowledge of how to select and install the correct piston rings.
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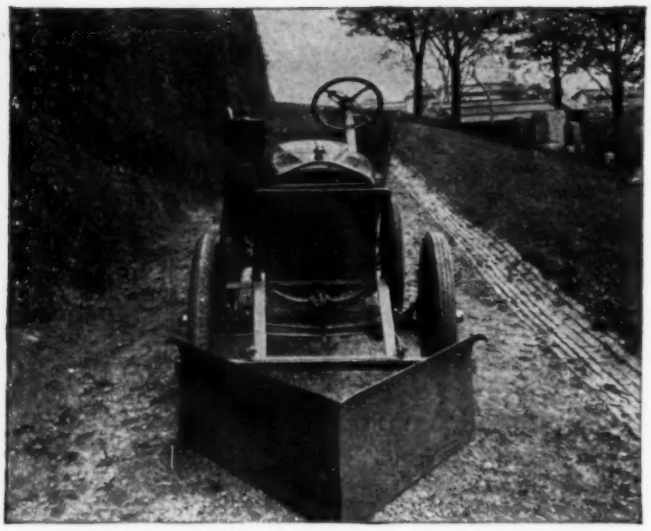
No line of piston rings has ever been produced to equal the PEDRICK line for completeness and ability to meet all piston ring problems. PEDRICK provides the correct type or combination of types for every conceivable condition in the automotive field.

NRA MEMBER U.S. WE DO OUR PART

Wilkening Manufacturing Co.
Philadelphia

Say "I saw it in FLEET OWNER"—It Helps!

Home-Made Trucks Handy for Ground-Keepers



Small ground truck fabricated by oxy-acetylene welding. Note the snow-plow affixed to the front, which comes in handy for light path and roadway work.

A later model of the above truck, also fabricated from scrapped parts, provided this second 1-cu. yd. dump job. Who can't guess the make of the original unit utilized?

FLEET maintenance men in large industrial plants as well as those in municipalities, are occasionally faced with the problem of keeping large landscaped areas in presentable condition. A great deal of manual labor is often spent for such operations as grass-cutting and raking, spading and the cleaning up of litter and leaves.

With the thought in mind that any idea for lightening the maintenance crew's work should be received with favor by the superintendent and the crew as well, we are pleased to present an idea devised by a welding expert in the East.

He noticed, when any landscaping was being done, or when the grounds were being cleaned up, that a great deal of time was spent in taking the necessary equipment to the place of work, and also that handling dirt or trash with a wheelbarrow was a tedious job.

This gave him an idea. He talked the idea over with the superintendent of the maintenance crew with the result that he was given an order for one small fabricated light truck with a dump body. If this proved successful, orders for more would be forthcoming.

The welding man lost no time. He visited a scrap yard and purchased an old auto chassis. Under his direction, his men proceeded to cut down the frame to a wheelbase of 5 ft. 4 in. and a width of 38 in. over-all. This he then mounted over the axles and wheels on four heavy springs. Out of sheet steel a light dump body was fabricated having a capacity of 1 cu. yd. This was mounted so that it could be easily emptied

Obviously the drive shaft, brake rods and other mechanical parts which were the length of the original car had to be shortened to fit the rest of the little truck. The first illustration shows the first such completed job. It met with such success when put to use that a second one was soon after ordered.

The second photograph shows this later model completed and ready for delivery. In this case a later model of the same type of auto was utilized in a similar fashion.

An interesting accessory for this job is shown in the snow plow fixed to the front end of the first truck that was completed. This was found ideal for clearing snow from the cemetery paths and roadways during the winter. Of course, this snow plow was fabricated by the welding shop as well.

The cemetery ground keeper found that the fabrication of these trucks was a real economy, as they saved a great deal of time in the work about the grounds to say nothing of fatigue and labor of his men. A great deal more work could be accomplished in a given amount of time than had previously been possible.

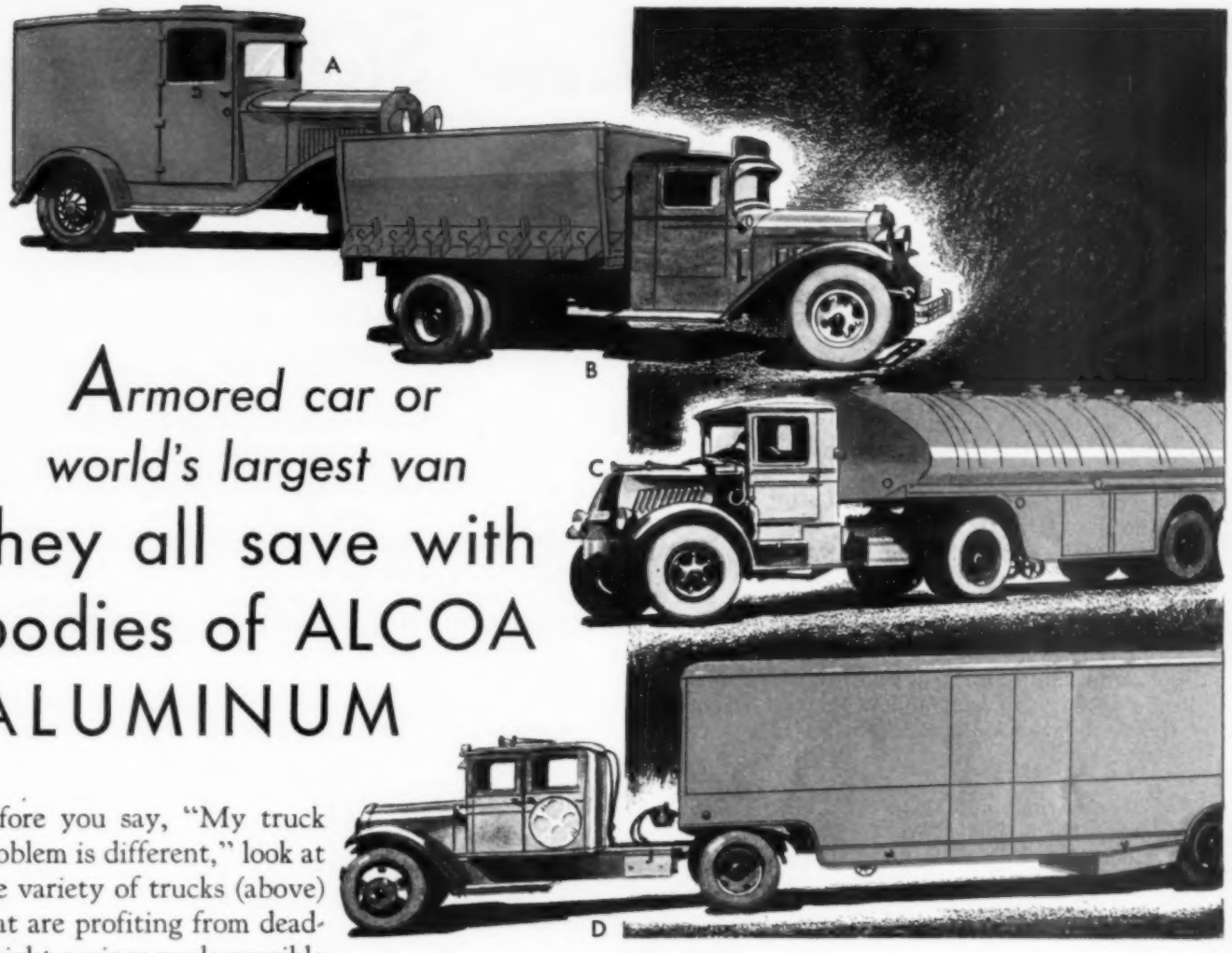
This is the type of job which any welding shop can profitably undertake and bring to completion easily and quickly by means of the oxy-acetylene cutting and welding blowpipes. It is, of course, a job which takes care, good engineering, and a good knowledge of welding and cutting. Undoubtedly other fleet maintenance men can profit from this labor-saving idea.

Some Uses of Alcohol

THERE are many uses of alcohol (distilled denatured) in minor service operations around the cars, garage and shop, without the use of special tools or equipment.

For instance, alcohol makes a very effective remover of carbon from engine cylinders, at a cost of about three cents per cylinder. Sticking valves can be freed by an injection of alcohol into the carburetor air intake. When water in the gas tank causes stoppage in fuel supply, alcohol will remove every trace of moisture.

Among other uses are the cleaning of white side-wall tires, tops, windshields, etc.



Armored car or world's largest van they all save with bodies of ALCOA ALUMINUM

Before you say, "My truck problem is different," look at the variety of trucks (above) that are profiting from dead-weight savings made possible by ALCOA Aluminum bodies.

With less dead weight in the body, you can take your choice of more pay load with the same operating costs, or the same pay load on a smaller and less expensive chassis, or faster deliveries and more stops. In any event you save money.

ALCOA Aluminum is equal to structural steel in tensile strength, yet only 1/3 as heavy. It's available in structural shapes, sheet, plate, rivets, bolts, nuts, castings and forgings. It can be fabricated on standard metal-working equipment.

ALCOA Aluminum withstands the heavy knocks of daily use. It doesn't rust, holds paint coats. In milk truck tanks it's non-contaminating, even in direct contact with milk. An ALCOA Aluminum body lasts years—even at the end of its usefulness it commands a high scrap price.

(A) Armored car body—weight in aluminum 1,150 lbs., permits use of small-size chassis, adds 10 miles per hour to speed, yet also allows as many as 100 stops per day.

(B) 7-ton gravity-flow coal body. Weight in steel 3,637 lbs., in aluminum 1,337 lbs., saving: 2,300 lbs.

(C) 5,000 gal. aluminum truck tank. Estimated weight in steel, 12,240 lbs., in aluminum 7,100 lbs., saving: 5,140 lbs.

(D) Van trailer, can easily hold furnishings of a 10-room house. Estimated weight in steel and wood, 9,500 lbs. (too heavy for highway regulations), in aluminum 5,075 lbs., saving: 4,425 lbs.

Make your next truck body an ALCOA Aluminum one. Write for booklet, on your company letterhead please, "ALCOA Aluminum for Truck Bodies". Tells how to design and build aluminum truck bodies, includes envelope containing large construction drawings and bills of material for various types of bodies, gives operating data on aluminum bodies now in use. Address ALUMINUM COMPANY *of* AMERICA; 1861 Gulf Building, PITTSBURGH, PENNSYLVANIA.

See Brockway Motor Company's Motorcade, depicting history of motor truck transportation. Shows during February in Newark, Philadelphia, Baltimore, Pittsburgh and Buffalo.

ALCOA ALUMINUM

Say "I saw it in FLEET OWNER"—It Helps!

Servicing Cam-and-Lever Steering Gears

By S. L. Bradley,
Ross Gear & Tool Company, Lafayette, Ind.

The Second of a Series of Factory-Sponsored Bulletins • How to Service Cam-and-Lever Gears With Side-Cover Adjustment

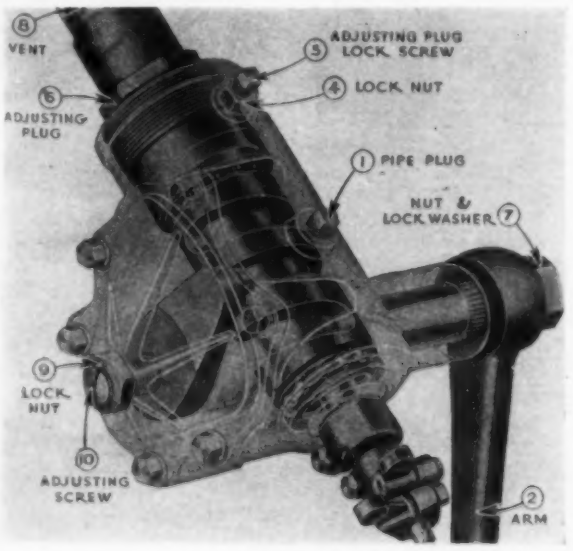
THIS second installment on steering gear servicing covers the factory-sponsored instructions for the lubrication and adjustment of the Ross Cam-and-Lever steering gear with side cover.

1. The Ross Cam-and-Lever steering gear will render efficient service with very little care if it is not abused. Ample lubrication of the proper grade will prevent excessive wear, also rattle. Adjustments should not be made unless clearly necessary, and then these instructions should be followed carefully. Improper adjustments ruin more gears than any other cause.

2. Do not try to cure wander, shimmy or road shock by tightening the steering gear.

Lubrication

3. Remove the pipe plug (1) and fill housing slowly with steering gear lubricant until it begins to run out of vent hole (8). If filled too rapidly the air cannot escape through (8) and the grease will be forced out of the gear at the top. Do not use ordinary grease (watch this particularly when having the car greased).



4. Use a heavy transmission grease of fibrous quality. It must possess cushioning as well as lubricating qualities but must not contain graphite in any form. Do not use a universal joint grease.

5. Replace the pipe plug.

6. Repeat every 5,000 miles. It may be necessary to do this oftener in some cases, especially if a rattle should appear or the gear feel draggy but do not wait till trouble forces you to it. Lubricate at regular intervals.

Adjustments

7. There are only two adjustments. They are simple, quickly made, do not require special tools and stay put.

8. Disconnect drag link from steering gear (preferably by removing drag link rear ball socket in most cases). Follow the instruction book of the car maker in this as there are several special constructions in use.

9. If the jacket tube is held in the adjusting plug by means of a clamp bolt, loosen the bolt. If there is no clamp bolt, the tube is pressed into the plug and the dash bracket clamp must be loosened so that the tube will turn when the adjusting plug is turned.

10. Note: Always make adjustments A and B in the order given.

A. Adjust Thrust Bearings to Take Up End Play in Steering Wheel Tube

11. Loosen the housing side plate adjusting screw lock nut (9) and then the adjusting screw (10).

12. Back off lock nut (4) and lock screw (5).

13. Turn adjusting plug (6) until a slight drag is felt when turning the steering wheel, then back off plug (about 1/6 of a turn) till wheel turns freely but not enough to allow of any up and down movement of wheel tube.

14. Tighten lock screw (5) and lock nut (4). Turn wheel to make sure that adjustment has not changed.

B. Adjust Housing Side Cover to Take Up Lever Shaft Play In and Out

15. Since sharp turns are made only occasionally, it follows that more wear must take place toward the center; that is, when the wheels are nearly straight. Therefore an adjustment for wear is not possible unless some provision is made to compensate for the greater amount of wear toward the mid position (of the lever shaft with respect to the ends of the cam).

16. Adjustment is made possible by the taper on the stud of the lever and a corresponding taper of the sides of the groove in the cam. The greater wear toward the center is compensated for by making the width of the groove narrower toward the mid position.

17. It is evident that as the groove narrows, the stud, because of the tapered sides, will ride higher—in other words it will move away from the center axis of the cam.

18. Therefore, adjustment for in and out movement (end play) of the lever shaft must be made at the narrowest part of the cam groove. The exact location of this narrow part is not important so long as it occurs within the ordinary driving range, (par. No. 15).

19. Tighten side cover adjusting screw (10) until a slight drag is felt when turning the steering wheel slowly from one extreme to the other. Test the end play of the lever shaft at various points as you go along.

20. Important. Note that the gear must not bind any place and that only a slight drag should be felt. A closer adjustment will not correct any steering

(Please turn to page 41)

Save spare part expense... use the FAFNIR PLAN

Reduce your ball bearing inventory! You can do it and still feel confident that when you need a bearing it will be in your shop quickly. Let a nearby Fafnir distributor carry your replacement requirements—that's part of the Fafnir Plan.

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Say "I saw it in FLEET OWNER"—It Helps!

Does Self-Servicing of Fleets Assure the "YES"

Says

Charles S. Lyon,

Motor Haulage Company, Inc., Brooklyn, N. Y.

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IN presenting the affirmative side of this question, it might be well to define a "fleet." In this discussion, we will consider as a fleet, any operation having fifty or more vehicles where the operation is confined within a radius of fifteen miles from the repair base. From the standpoint of maximum maintenance efficiency it may or may not be considered essential to maintain a shop where the units number less than fifty, or where the operation is decentralized sufficiently to extend beyond the fifteen-mile radius.

The question of whether or not a fleet operator should maintain his own shop for maximum maintenance efficiency also depends to a great extent on the character of the business. When I say the character of the business, this is what I mean—take the commercial trucking operator, for instance—take our particular business if you will—where by the ring of a telephone we may have to change from an open car to an armored car—not one unit but possibly twenty-five units, as happened the night Prohibition was repealed, when it was necessary for us to put on armored cabs which we had in reserve. That kind of service means service to the customer, and also means ultimate reduction in our cost. If we had to go to outside service stations, there would be a lack of individual familiarity with the fleet in question.

Another thing, the commercial trucking operator must, in order to continue in existence, make a profit. He is solely dependent upon the revenue of those vehicles, for a livelihood; they are not a necessary evil with him. Therefore, every phase of their operation must be subjected to microscopic scrutiny in order to get the efficiency down to a matter of dollars and cents.

In the case of outside service stations, they have their problems of location, in the relatively productive territory surrounded by the greatest number of trucks they service. They, of course, are interested in the customer's lost mileage, but they can't control that, because they must deal with each fleet generally and no discrimination can be made, whereas, the individual operator understands his problem of lost mileage and can better control it.

If the majority of our customers were located, we will say, in the lower part of Brooklyn, it would be ridiculous for us to have a service station in the Bronx, because we must take our vehicles back and forth. The customer ultimately would pay for that lost mileage, because we can't exist without a profit.

Therefore, it is our opinion that company-owned service stations can be located to the best advantage, from a mechanical dollars and cents standpoint. We are interested, obviously, in reducing the cost of transportation, and that is our only excuse for remaining in business. If we can't give them a better and a higher grade of transportation at less cost than they can perform it, we have no reason for existence.

Let us attack the question of rents; of fixed charges. I maintain that fixed charges in outside service stations are invariably higher than in self-maintained service stations. They can't be lower. Take, graphically, the City of New York, and consider any of the large service stations and where they are located. They must first be located at convenient distances, insofar as transportation is concerned, and also on prominent streets. That has an advertising value. Obviously, the rent is a great deal higher than the rent of individual service stations, where a man locates his station at the most economical base of operation.

Take the other big items of fixed charges—light, heat, water, insurance. They are fixed items that must be borne whether you are operating an individual station or not. Our fixed charges cannot be greater than those of outside service stations. They are lower in every instance where I have had experience, and I want to say here that we have had outside maintenance and have discontinued it.

We are lower than they are when it comes down to personnnel. There is every difference in the world between the personnel that we might select as an individual operator of our own service station, and the personnel of the outside service station. There is one salient fact that you must consider in the individually-operated service station. It is this: Your personnel does not fluctuate with your business as it does in outside service stations.

I have had occasions, in sending trucks to outside service stations at the time we gave up our service stations for a while, where we could not know that at five in the evening we would have to call up Mr. Smith and say we would have five trucks over there for a top overhaul that night, because we had to wait until each vehicle came in with a mechanical trouble report. Mr. Smith, of course, goes off at five o'clock. His personnel fluctuates. That mechanical man who is the limb of the organization (and don't forget it) has not and can not gain that personal

(*Please turn to page* 40)

Charles S. Lyon

AS Vice-President and General Manager of The Motor Haulage Company, Inc., he is recognized as one of the most prominent and successful fleet executives in the country. In his present position he has charge of some 250 vehicles which include trucks, tractors and trailers. He was formerly with The Standard Oil Company of New Jersey as Superintendent of Motor Vehicles for the New Jersey Division. He has also been Equipment Engineer for the General Motors Corporation in the truck division. He has been with Motor Haulage for the past twelve years.

Maximum in Maintenance Efficiency?

"NO"

Says

M. C. Horine,

International Motor Company, New York City.

IN refuting the arguments advanced by the affirmative side of this controversy it is unfortunate that Mr. Lyon has arbitrarily decided on what constitutes a fleet. The question, "*Does Self-Service of Fleets Assure Maximum Maintenance Efficiency?*" is just that. There are no "ifs, ands or buts" in it. Since Mr. Lyon has very adroitly defined a fleet as one having fifty vehicles or more, it goes without saying that many of you fellows (who haven't fifty vehicles) don't belong here.

Not only do I deny the general statement that self-service by fleet operators is *per se* more efficient than manufacturers' service station maintenance; but I feel constrained to go further and declare that there is no such thing as self-service by fleet operators. A non-existent thing cannot conceivably be better than something which does exist!

No fleet operator completely maintains his fleet on his own premises. Neither, for that matter, is any fleet maintained completely in manufacturers' service stations, unless the vehicles are garaged in the manufacturer's branch. At the very least the operator will maintain tire pressures, attend to replenishments of gas, oil and water, flush and change batteries and do a certain amount of trouble-shooting in his own garage. At the most, on the other hand, he will be obliged to farm out a certain amount of his maintenance work, either to the service station or to independent specialty shops. I never have heard of an operator, no matter how many thousands of dollars he had tied up in parts, who did not depend upon service station stock for some parts, and generally a considerable number of them, confined for the most part to those which are less frequently required.

Although some fleet owner shops go in for cylinder grinding, crankshaft trueing and main bearing work, their number is small and confined for the most part to bus operations where manufacturer service is non-existent in their territories. Sometimes attempted, but not always satisfactory, is the rebabbitting of direct-babbitted connecting rods and main bearing caps in operator maintenance plants. By the exchange system now in wide use, a first-rate factory job is obtainable in so much less time and at so much lower cost that here, at least, the service station will be relied upon.

Besides the service station, specialty shops, too, are necessary for some of this work, such as magneto or distributor repairs, armature and commutator work on generators and starters, repair of voltage regulators, carburetors, air brake parts, shock absorbers, speedometers and springs.

Thus it may be said that maintenance is always divided among the home shop, the manufacturers' service stations and the specialty shops. The whole question at issue is therefore the matter of the ratio between the amount assigned to each agency which will yield the highest efficiency. There can be no hard and fast rule in respect to this ratio if real efficiency is to be obtained; but the ratio in each case will depend upon circumstances. The best ratio will be found only by a factual analysis of all conditions existing in and surrounding the operation.

Obviously the larger the fleet, the greater the proportion of self-maintenance that will probably prove advantageous; the smaller the fleet, the greater reliance upon the manufacturers' service stations. But, there is more to the subject than just the size of the fleet.

Concentration of the fleet is of greater importance than its size, as Mr. Lyon has clearly indicated in his statement that the fleet he has in mind is fifty vehicles or more, operating in a fifteen-mile radius. A city bus operation represents ideal concentration, whereas a public utility or a chain store, even though its vehicles are numbered in the hundreds, usually involves such a scattered distribution of vehicles that there will be few points where a shop set-up of any extent will be warranted.

Even where fifty or more vehicles are concentrated at a single base point, it makes a vast difference whether these represent one make or numerous makes; whether they are of one or two types and models or several of each. Range of operation, too, makes a difference. A home shop means much more to a fleet operating always within towing distance of it than to one whose vehicles range through a radius of a couple of hundred miles.

Comparisons between self-maintenance or service station maintenance must be affected to a considerable extent by the character of service offered by the manufacturer in a particular locality. A well-stocked, modernly-equipped and competently-manned direct factory branch nearby will stack up much more favorably than a small dealership with a meagerly-stocked, crudely-equipped and questionably-manned shop, located 50 miles down the line.

Time is often a strong incentive to self-service; but it does not always go without saying that the

(*Please turn to page* 42)

M. C. Horine

AS Sales Promotion Manager of the Mack-International Motor Company, he is a well-known authority on motor vehicle maintenance. After shop experience with various companies he turned to writing and became Technical Editor of MOTOR AGE in 1912. A year later he was appointed Editor of THE COMMERCIAL VEHICLE. This work was interrupted by the world war in which he rose to Second Lieutenant in the Air Service, his duties including research and experimental work in motor transport problems. He has been with the Mack-International Motor Company for the past fifteen years.

More about Self vs. Outside Maintenance

By G. W. Reimann,

Supervisor, Motor Vehicle Shop, Railway Express Agency, New York City.

IN our company, we operate over 1,300 vehicles. Were we to consider fleet maintenance by outside agencies, what would we do with those vehicles whose makers are now out of business and where no service station is maintained for them? Where would we send these vehicles for repair?

We have one central shop right in New York City and also several shops scattered about the City. There is something to "overservicing" and "underservicing" some of the parts that we do send out for repair. Some of our repair work we do ourselves. Sometimes we need parts. Sometimes we are told that we will have to wait until they come from the factory.

One other thing we would like to know? Where does the manufacturer purchase his parts? In your shop, if you have one car out of service, working on it, you can always use various parts from that car to keep several others on the road. On the other hand, if your cars are sent out for repair, you cannot do that.

●

By H. V. Middleworth,

Superintendent of Operations, Consolidated Gas Company, New York City.

IN order to maintain an outside truck service station, it must be equipped with modern machinery and all the equipment necessary to turn out a first-class job. It must be supervised by high-class men, in charge of competent mechanics, especially-trained in the repair of motor vehicle equipment. It must carry a large stock of spare units, parts, supplies, etc. All of this costs money. The service station must make a profit and the customer must pay the bill.

The small fleet operator could not possibly justify the cost of such equipment, and must depend upon the service station for economical maintenance. The large fleet operator who is able to spread the cost of such equipment over a great number of vehicles, can undoubtedly justify the expense of setting up the machinery and personnel.

The operation of a self-service establishment is less expensive because it is not necessary to carry more than a limited supply of spare units, parts, materials and supplies, because these can be purchased as occasion requires.

Also in a self-service organization, it is essential that a portion of the shop be equipped for periodic servicing and minor repairs, which could not be handled efficiently by the outside service station because of time out of service, and the expense incurred thereby. It is not necessary that this part of the shop be manned to peak efficiency at all times. The men could be assigned to this work as occasion demanded, returning to their regular duties at other times.

One great advantage in self-servicing of fleets which is considered important,

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You've Read the Discussion on the Preceding Pages— Now Read What Other Operators Had to Say About It

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in fact, essential, is that the work done is constantly under the direct supervision of the man who is responsible for the economic maintenance of that fleet. If an operator has a sufficient number of vehicles so centralized as to justify the establishment of a self-service repair shop or station, and if he employs a supervisory force in charge of competent mechanics, equal to the service station, there is no reason in the world why his fleet can not be maintained satisfactorily, economically, and efficiently.

●

By John Crone,

Asst. Supervisor Motor Equipment, The Texas Company, New York City

THE company I am with operates more than fifty trucks. I do not know where they have a unit of fifty in one spot (in Long Island City there are about thirty-eight) yet we have to maintain these units where they happen to be working or where they are at that time, over the twelve months of the year, against the fact that during eight months of the year, we have peak service and do not have any (or, at least, very few) spare units to put into service if one breaks down.

During the other four months of the year, we have what we call an overhaul program. We take those units and start in a complete overhaul program, ripping them out, repainting, taking down motors and so on. That was done up until this year, when we discontinued the shop. We are now operating without any repair shops. We have retained a supervising force which inspects the units and checks them, traveling from place to place, wherever they are. We are using the manufacturers' service stations as ours. The manufacturers are allowing us to make inspections of the parts that Mr. Lyon says he would like to see. We do that. We pass on all parts of the units going into the trucks.

Mr. Lyon also mentioned that major overhauls were 50 per cent of the total cost. He gave one of the main reasons for maintaining his shop as the fact that he could get a discount on those parts. I don't know if everyone does it; I don't know if it is general in the trade. We get that discount. We also get it when the manufacturer is doing the work. So the only thing we could possibly save is a small portion of the labor charge.

When we added our labor to our overhead, we found that we were practically paying the same (within a very small percentage) as what the manufacturer would charge us to do it in his own shop. We also had standing against that, the fact that we could only maintain our shop at full force, four months during the year. The other eight months, we had to operate with a skeleton force.

During the winter, when we did the overhaul program, we had to boost up the force of men and try to take care of the maintenance of these trucks. When we got the unit in, we had to work on the assumption that it was not coming in for another twelve months. At that, we would have to overhaul the unit, but it would stay on the road approximately twelve months. Our service station was too distant from where the units were operating to bring them in.

When we tore down the unit, it wasn't just a case of maintenance and service, it was a case of putting that car in condition for twelve months' service. Operating under the method we use now, we are relieving these units as fast as we can to the manufacturer's service stations. We are depending on them to stock the parts and to bring the vehicles back into service as fast as possible.

●

By Joseph Husson,

Engineer, Automotive Bureau, Borden's Farm Products Co., New York City

THE subject of this discussion is more-or-less ambiguous. Each speaker, in order to talk upon it, has to set up his own set of conditions. Perhaps it could have been discussed more accurately if the resolution had been worded somewhat in this fashion: *"Where, when, and under what conditions does self-service become more economical than manufacturer's service?"* Under such a set-up, the speakers would have been able to point out the advantages of both systems, for, evidently, like the old story, there are three sides to the question—your side, my side, and the other man's side.

Speaking now from my own experience of ten years in operating a large fleet of trucks, I have found that with a fleet of approximately two hundred vehicles, operated not within a fifteen-mile area but within a fifty-mile area, and with a make of vehicle in which we have the same engine in all of them, we were able to maintain that fleet for direct labor and material and all other charges entering into maintenance, at less money than we would have had to pay to the service station of the maker of that particular truck.

I say that because the company with which I was connected was controlled by a Board of Directors, and a Board of Directors is very inquisitive, and when some man comes in and tells them that their business can be run at a great deal less money, they prick up their ears and begin to ask for figures. I had that happen to me on many occasions and often had to justify the principles of maintenance upon which this particular fleet was being maintained.

Summarizing the reason for this cheaper self-maintenance under the conditions which have been outlined, we felt that with a proper set-up in our organi-

(*Please turn to page* 47)

Has ECCENTRIC GRINDING made ALL OTHER METHODS of Valve Seat Servicing OBSOLETE?

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Say "I saw it in FLEET OWNER"—It Helps!

TROUBLE SHOOTER

(You Ask 'Em — We Answer 'Em)

A department, devoted to correspondence from readers of FLEET OWNER. Any questions having to do with automotive service will be answered in this department. All properly signed inquiries will be replied to by mail and such of them as are believed to be of possible interest to other readers will be published in these columns.

Will Some Engine Mfr. Oblige?

Question: Having read in FLEET OWNER *some time ago about brake h.p. tests, I would like to inquire as to the actual conditions under which such b.h.p. tests are run. I know that all tests are made on electrical dynamometers, but I am wondering whether or not these tests are made with all accessories in place, such as water pump, fan, generator, etc., and also as to the type of fuel used.*

Answer: According to our knowledge, this practice varies somewhat. Some manufacturers of engines test them *with* water pump, fan and generator in place and some test them stripped of these accessories, with the possible exception of the water pump. It is not considered necessary by some makers to use carburetor air cleaners when making h.p. tests.

As to the type of fuel used, this is something we have never inquired about. Liquid fuel is used for making actual h.p. tests and it goes without saying that the best possible fuel for that particular engine, compression ratio, etc., would be selected. It has been the practice among large production manufacturers to use city gas, or natural gas for running-in purposes, after the engine has been limbered up by outside means.

(If some engine manufacturer will be kind enough to write to the Editor of this publication, outlining his method of making brake h.p. tests, we'll be glad to publish this information in an early issue.—EDITOR.)

You May Not Believe It!

(But It's True)

THE FACT:

EVER hear of "black light"? There IS such a thing. Instrument panels can be illuminated with it.

EXPLANATION:

THE use of ultra-violet rays to make visible at night the instrument panels of automobiles has been forseen as the result of development work done with this ray by the Westinghouse Electric & Manufacturing Company. Although these rays are invisible, they increase the natural fluorescence of radium dial markings so that instruments coated with radium are clearly visible at night. The use of ultra-violet radiations in this manner is perhaps of immediate value on buses and trucks which are subjected to much night driving. It would be very desirable to have the interior of the cab or bus body completely dark, at the same time having the instruments clearly visible. This practice has been appropriately termed "black light."

Standard Stopping Distances Adopted

NEW standards for stopping distances of vehicles with foot and hand brakes have been adopted by the New York City Police Commissioner, on recommendation of the Committee on Brakes, appointed by the Commissioner to investigate the functioning of brakes under current manufacturing methods and under normal New York City highway conditions.

The new stop requirements are as follows:

SPEED		STOPPING DISTANCES IN FEET		
Miles per Hour	Feet per Second	2-Wheel Brakes	4-Wheel Brakes	Emergency Brakes
5	7.3	2.7	1.4	3.1
6	8.8	3.9	2.0	4.5
7	10.3	5.3	2.7	6.1
8	11.7	6.9	3.6	8.0
9	13.2	8.8	4.5	10.1
10	14.7	10.8	5.6	12.5
11	16.1	13.1	6.7	15.1
12	17.6	15.6	8.0	18.0
13	19.1	18.3	9.4	21.1
14	20.5	21.2	10.9	24.5
15	22.0	24.4	12.5	28.1
18	26.4	35.1	18.0	40.5
20	29.3	43.3	22.2	50.0
25	36.7	67.7	34.7	78.1
30	44.0	97.4	50.0	112.5
35	51.3	132.6	68.0	153.1
40	58.7	173.2	88.8	200.0
45	66.0	219.2	112.4	253.1
50	73.3	270.6	138.8	312.5
55	80.7	327.5	167.9	378.1
60	88.0	389.7	199.8	450.0

NOTE: A—Vehicles should meet above requirements when loaded.
B—Two-wheel brakes stopping distances have been adjusted to allow for 17 per cent. transfer of weight.
C—Brake tests should be conducted in accordance with General Orders 19, 1932.

As some vehicles are unable to attain the speed of 20 miles an hour, as in the case of governed vehicles or electric, the above chart lists proper stopping distance from 5 to 15 miles an hour at 1 mile per hour intervals.

The above figures show actual rates of speed, which, in many cases, are in excess of LEGAL rates of speed.

The members of the Committee were David Beecroft, of the Bendix Corporation; Dr. F. C. Stanley, of Raybestos, Inc. and S. G. Tilden, of S. G. Tilden, Inc., all authorities on brakes; Harold Riegelman, Attorney; Thomas W. Rochester, Chief Engineer of the Police Department, and Lt. George S. Andrews, of the Vehicle Homicide Squad.

NEW FINISHING PROCESS AMAZES FLEET OWNERS!

"VALENITE 25 years ahead of the times"—*say experts*

IT'S the talk of fleet owners everywhere. They're all saying, "My units will be finished with Valenite next time." One look at a Valenite job tells why. High gloss tells the story of extra hardness and beauty as nothing else can. This tough-as-steel protection *can take it!*

TWICE THE RESISTANCE TO WEATHER CONDITIONS

One fleet owner asked us, "My trucks travel everywhere from sun-scorched deserts to snow-filled mountain passes. Will Valenite keep its gloss in those extremes of weather?"

Mr. Fleet Owner, Valenite retains paint shop gloss *twice as long* as the next best method—*three times* longer than the best old style Varnish job. Applies safely over fabric, wood, metal.

So now you don't have to throw money away on finishes that do only part of the job. Valenite provides a system complete from primer to finishing coats. Get the facts about this modern system by mailing the coupon below. Or phone the Valentine salesman today.

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Dear Sirs: I am interested in the facts about Valenite. Please send me a copy of "Valenite The Modern Finish."

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*Address*_____

Say "I saw it in FLEET OWNER"—It Helps!

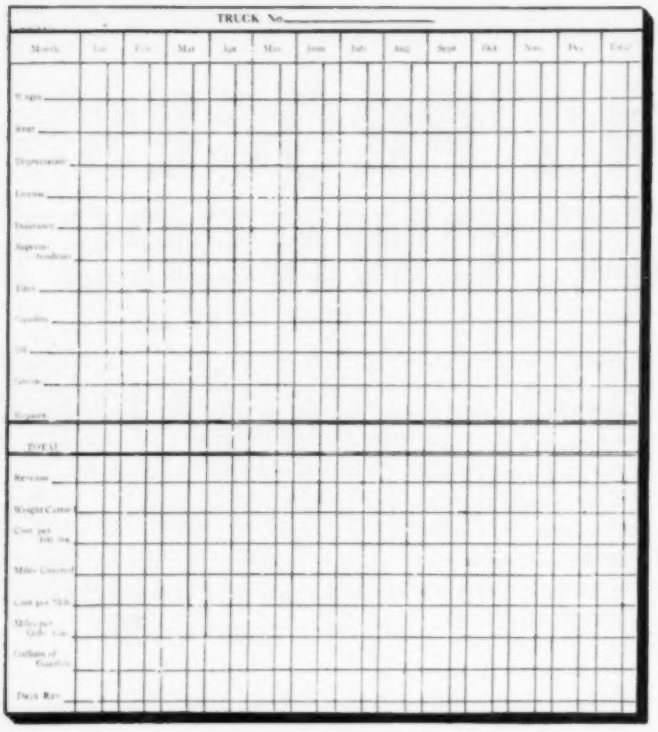
TROUBLE SHOOTERS' DEPARTMENT (*Continued*)

This Will Help You Recapitulate

Question: Do you have, or do you know of any kind of chart or record card that can be made up to show the cost of repairs, gas, oil, tires, etc., per truck per month, with a grand total at the end of the year to show the cost of operation per truck, per mile, without having to wade through card files, repair cards and shop records?

I feel that such a record could be kept up-to-date on a large sheet of paper or cardboard, with the record of each month alongside of each truck number. Thus, at a glance, one could compare each truck or see just how far it has gone and observe all costs for any particular month. What can you suggest in this connection?—A. W. S., Philadelphia, Pa.

Answer: If you have saved your copies of FLEET OWNER for the past several years, you'll find many such forms illustrated from time to time, in connection with fleet experience stories.



We are printing herewith one of these forms, and are sending you a batch of other samples under separate cover. Other readers will probably find the above form of interest. It is used in a large brewery fleet and, with slight modifications, we believe it could be adapted to the requirements of any fleet. Should other operators care to submit any such forms that have worked out especially beneficial, we'll be glad to pass the information along.

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Which Polish to Use?

Question: On page 16 *of your November,* 1933, *issue there is a photograph showing how the panels of delivery bodies are polished with a home-made polishing bat. We have made several bats of this kind and are trying to locate a suitable wax for this purpose. Can you tell us what polish this particular fleet is using and what success they are having with it?—B. C. G. Co., Boston, Mass.*

Answer: On further investigation, we find that the firm in question has gone back to daily washing of their vehicles, except in cases where they are exceptionally clean and just a bit dusty.

In such cases, they are using the polishing bats mentioned, but so far they have not succeeded in finding the correct liquid gloss for this purpose. They report that this dusting is done just as you would dust your piano, or your office desk.

You might try spraying the polishing bats with some such polishing oil as lemon oil. The cloth should only have the faintest trace of the oil—just enough to remove the dust without leaving a film. It should not be completely saturated, as this will require a large amount of oil and will only serve to leave a dust-collecting film on the bodies.

At the time the photograph was taken, the company in question was experimenting with various liquid glosses in order to eliminate the daily washing, but they report that they have not been successful in this respect. We'd be glad to hear from other operators on this subject.

●

Who Knows of a Trick Starting Device?

Question: We use a number of heavy motor trucks and during the winter months it is often difficult to get them started. Perhaps you would know of an arrangement that could be rigged up with an electric motor, using house current, to crank the truck motors, and thus relieve the strain on the batteries?—Tennessee Operator.

Answer: There is no reason why you should have trouble in starting your truck motors on cold mornings, that is, provided that your fleet is properly maintained with the motors well tuned-up and in good mechanical condition.

The use of a very light oil in winter will do more to relieve the strain on your batteries than any other single factor. A light oil will also produce other operating economies. Too many operators make the mistake of using heavy oils in winter. We know many who use S.A.E. No. 50 in summer and No. 40 in winter. These, as recent oil research indicates, are far too heavy.

Your electrical units, too, should be kept up to snuff. If generators function properly, if batteries of large enough size are used, and your coils are efficient—not weak or half burned out—we see no reason why you should experience hard starting, providing of course, that you are using a fairly decent grade of gasoline.

We have never seen a device for starting engines that could be used on 110-volt current. You could, however, use an extra battery in the garage, of sufficient capacity to start the motors in the morning, leaving the regular battery in each truck to provide the ignition current. After the trucks have left the garage, the extra battery could be placed on the charging line, ready for the next morning's work. Should any of our readers have suggestions to make along these lines, the Editor will be glad to hear from you, and will pass along the information.

YOU CAN ALWAYS BE SURE OF

1. Lower Cost per Stop
2. Less Adjustment
3. Greater Safety

WHEN YOU EQUIP BRAKES WITH

AMERICAN BRAKEBLOK

THE economy of American Brakeblok for trucks, buses and passenger cars is not based merely upon the longer life and greater usable thickness of the material, but also upon its notable tendency to keep brakes in better adjustment.

Differing from other brake linings, American Brakeblok is non-compressible and does not swell under any conditions. Thus, the correct braking clearance is maintained for long periods, with an absence of dragging, locking or slipping. Necessity for frequent adjustment is eliminated and the equipment stays out of the shop as far as brakes are concerned. Fleet operators frequently report cases where trucks or buses equipped with American Brakeblok have gone incredible distances with only routine attention.

American Brakeblok, the original non-fabric brake lining, is available in all forms —Rolls, Full-Coverage Sets, Keeper Type, and Bolt-On Full-Coverage Type Brakebloks—for every type of service. The fundamental character of the material is the same in every form. The alloy-grid or mesh backing, by allowing deeper counter-sinking, adds greatly to the thickness of usable material, gives maximum security of anchorage and utmost precision in installation.

Reduce *your* braking costs as hundreds of other fleet operators are doing—by standardizing on American Brakeblok. Write for full information on any type of installation.

Quick Facts About American Brakeblok

This new type of braking material is:

—a dense, homogeneous solid—the same clear through.
—formed under pressure—not woven or laminated.
—scientifically heat-treated.
—ground to absolute uniformity in thickness.
—resistant to highest braking heats.
—non-compressible under braking pressures —stays in adjustment longer, minimizing possibility of squeals.
—made with an alloy backing that gives greater thickness of usable material—longer life—and better installations.

AMERICAN BRAKEBLOK
Reg. U.S. Pat. Off.

AMERICAN BRAKEBLOK CORPORATION • 4660 MERRITT AVENUE • DETROIT, MICHIGAN, U. S. A.
New York, Cleveland, Chicago, St. Louis, Los Angeles, San Francisco
A Division of **American Brake Shoe and Foundry Company**

Say "I saw it in FLEET OWNER"—It Helps!

as WE GO to PRESS

(News of the Truck Industry)

APPROXIMATELY 363,000 motor trucks were produced by American manufacturers last year, as compared with the 237,500 output of 1932. This marks the first increase for a 12-month period since 1929. The 48% increase reflects not only improvement in general business conditions, but also the pressing need for motor truck service to fill shipper requirements in moving various commodities cheaply and speedily.

•

THE question of fleet discounts on automobiles, insofar as car dealers are concerned, has been settled to the extent that the dealers are expected to bill all fleet sales at top list, according to the latest N. A. D. A. ruling. The so-called "fleet discount" will appear in the form of a rebate that will come direct from the car manufacturer to the fleet operator. No information as to the amount of this rebate has been released. However, only "quantity purchasers" whose total purchases for the current 12-month period reach a volume of $15,000 or more, will be elegible for the rebate, regardless of the size of the fleet.

•

"A TRUCK cab containing a couch on which any tired human being can obtain restful sleep" is the way The Autocar Company, Ardmore, Pa., describes its latest development. The sleeping berth is made in two sections, one of which is changed from a sitting to a reclining position very much the same as a berth is provided in a Pullman sleeper. The other section, which makes the foot and leg rest, is folded back under the cowl when not in use. Thus, the sleeper lies parallel to the motion of the truck, rather than at right angles to it, as in conventional cabs. The back of the sleeper seat can be adjusted to any position. Autocar will be glad to send you full details, if you but ask.

•

PISTONS—a complete line of them for replacement on passenger cars, trucks and buses is announced by Ray Day Piston Corporation of Detroit, Mich. In addition to the standard Ray Day line, this service will include factory duplicate alloy pistons of all types, including the strut type, and also a complete line of factory duplicate cast iron pistons and pins. A complete catalog is ready for you. Just write to Ray Day Piston Corp., Detroit, Mich.

THE Highland Body Manufacturing Co. of Cincinnatti, has just completed a tractor-semi-trailer motor-coach unit which weighs less than 300 lbs. per passenger. It is called the "Highland Articulated Coach" and is being operated at present by one of the inter-city bus lines out of Cincinnati. Passenger appeal, safety, comfort and economy of operation are stressed by the manufacturer, who will be glad to send full details and photograph on request.

•

WE'VE read an announcement, somewhere, to the effect that Garford Trucks are to be produced again in the old Relay plant, by the Consolidated Motors Corporation, which has acquired the plant as well as the Garford name; also the Relay axle. J. G. Wray is president of the new corporation, Jack Harsch is vice-president and general manager and H. A. Beeson is secretary and treasurer.

•

A GOOD sales record for 1933 is reported by Federal Motor Truck Company which closed its books for the year with dealer orders showing an increase of 51 per cent over those of 1932, according to J. F. Bowman, vice-president in charge of sales. "We are getting ready for a busy 1934," he remarked.

•

GENERAL and executive offices of SKF Industries, Inc., were moved last month to Philadelphia, Pa., from New York City. There will be no changes, however, in existing branch office addresses. This removal represents, in effect, a consolidation of manufacturing, sales and engineering facilities through which it is planned to improve their already good service. The new address will be SKF Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.

•

TO meet the requirements of independent front-wheel suspension, the Fafnir Bearing Company of New Britain, Conn., has developed a new "ball bearing bushing" available in several forms. It is essentially a double-row ball bearing, packed with grease and sealed to retain the lubricant for the life of the bearing. However, a lubrication fitting can be provided if desired. Complete information will be sent to those interested, on request.

A NEW crankless Diesel engine was exhibited at the New York Motor Boat Show last month. It is a product of Sterling Engine Company, Buffalo, N. Y. The new engine is a two-cycle job with horizontal cylinders each containing two opposed pistons. Combustion is obtained by compressing the air between the heads of each pair of pistons and injecting the fuel which ignites by the heat of compression. Thrust of the pistons is transferred to inclined discs which are virtually flywheels mounted on the main shaft of the engine. Mitchell patents, under which the engine is manufactured, make possible this job, said to have the same weight, speed and power of a gasoline engine.

•

THE manufacturers of Toledo valves, water pump parts and other parts, have asked us to inform you that Reinhard Brothers Company, Inc., Minneapolis, Minn., are stocking Toledo water pump parts in their three branches, as well as in their headquarters in Minneapolis. Branches are maintained in Minot, N. Dak., Aberdeen, S. Dak., and Winona, Minn.

•

THE appointment of R. L. Sommerville has been made by Electric Storage Battery Company, as "Manager of Automotive Replacement Sales" for Exide batteries. Mr. Sommerville was connected with the New York office of Exide for 12 years prior to his transfer to the general offices in Philadelphia a year and a half ago. Our best to you, Mr. Sommerville!

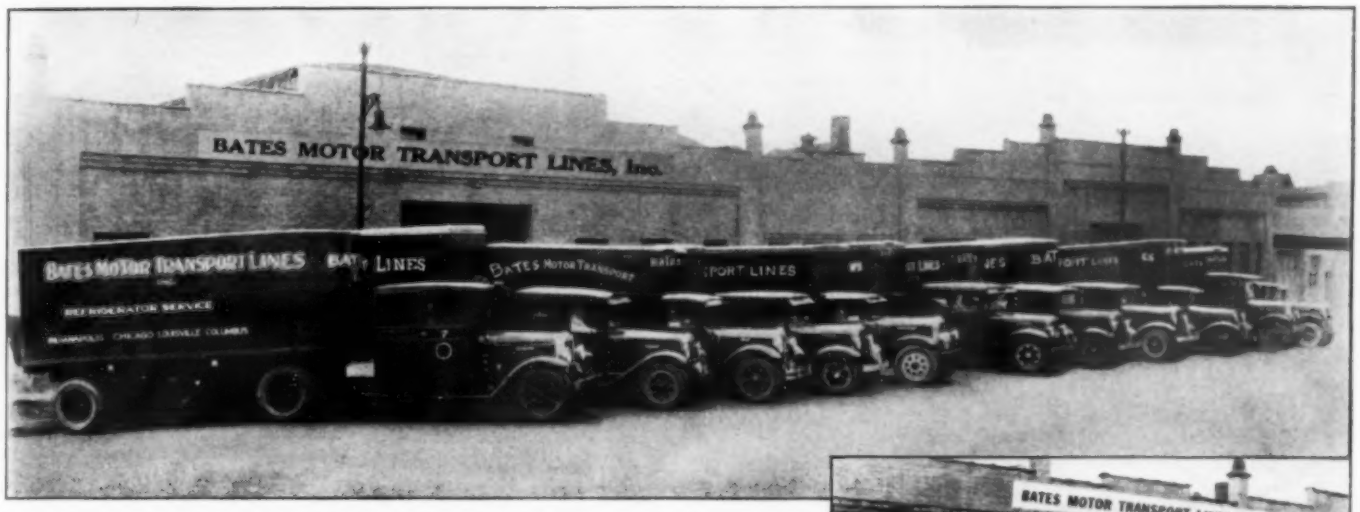
•

REPLACEMENT fenders for the 1933 Chevrolets have just been announced by The Fostoria Pressed Steel Corporation of Fostoria, Ohio. This is in addition to their line of Fostoria Fenders for older models of Chevrolets, as well as for Fords, Plymouths, Buicks, Chryslers, Studebakers and many other cars. A free wall chart showing all of these can be obtained on request.

•

APPOINTMENT of O. W. McMullan as Chief Metallurgist is announced by the Timken-Detroit Axle Company. For the past nine years Mr. McMullan has been assistant chief metallurgist, in charge of research and improved practice at Timken.

OIL CONSUMPTION CUT IN HALF!



HOW BATES MOTOR TRANSPORT LINES CUT OIL CONSUMPTION RIGHT SQUARE IN HALF WITH PENNZOIL DURING SIX WEEKS' TEST

IT began with a check-up on maintenance costs. Too big a slice was going to oil and motor repairs . . . so figured the Bates Motor Transport Lines of Chicago.

And instead of sitting back and "taking it on the chin," they got to work and tested several well-known brands of high-grade Pennsylvania oils. Tested them over the same runs . . . in the same trucks. And the result? Mr. R. A. Luken, V.-P. of the Bates Lines gives the facts when he writes:

"We selected PENNZOIL and after six weeks' trial we found that we had used but half as much oil as formerly. With this surprising result we tested other brands for a like period in order to make certain that our selection for permanent use should be the best product available.

"These gave satisfactory performance in that they gave better service than the oil we had been using.

However, PENNZOIL'S record stood out clearly, so we have standardized not only on your motor oils, but on your entire line of automotive lubricants."

Saves Money on Gas

PENNZOIL is refined from the finest Pennsylvania crude. It is 3 times concentrated so that it has an amazing tough film and far better lubricating qualities. It cuts down "engine drag" so remarkably that all engines run smoother and easier.

Cut *Your* Maintenance Cost

Get out your cost sheets and check up on how many gallons of oil you used last month. Figure what it costs you in actual dollars and cents!

Now imagine that oil consumption figure cut right in half! Don't the savings warrant at least an investigation? And think of the savings in repair bills!

Remember, it won't cost you anything to learn the facts . . . to find out how fleet owners the country over are saving money with PENNZOIL. Simply mail the coupon for the facts.

THE PENNZOIL COMPANY

Executive Offices: Oil City, Pa., Los Angeles, Calif., British-American Oil Co., Ltd, Sole Distributors in Ontario and Quebec, Canada.

BONDED PENNZOIL DEALER
100% Pure Pennsylvania
PENNZOIL
Safe Lubrication

Member Pennsylvania Grade Crude Oil Association, Permit No. 2

JOE, WHAT'S WRONG? WE'RE USING CHEAPER OIL AND OUR OIL COSTS ARE HIGHER THAN EVER
BOSS, CHEAP OIL NEVER SAVED ANYONE MONEY. WE SHOULD USE PENNZOIL

THE PENNZOIL CO., Dept B-2, Oil City, Pa.
Please send me information about how PENNZOIL Motor Oil cuts operating costs for fleet owners.

Name.....

Address.....

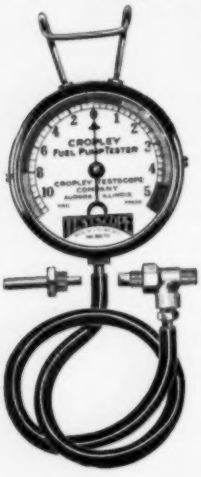
City.....State.....

Say "I saw it in FLEET OWNER"—It Helps!

for ROAD *and* SHOP

Fuel Pump Tester

THE Cropley "Testscope," illustrated here, was developed for the purpose of testing fuel pumps under actual working conditions, without removing them from the motors.



Both pressure and suction of the fuel pump can be checked, and a direct reading is given on the face of the dial.

This instrument makes it possible to test the fuel delivery system from tank to pump, as well as pressure to carburetor.

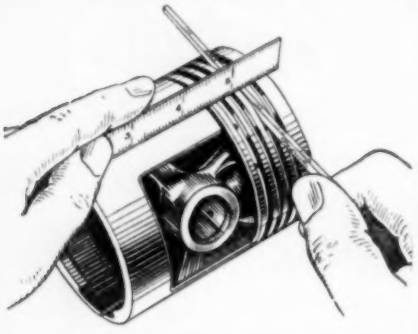
Such defects as leaky valves, imperfect diaphragms and leaking fuel lines are shown up quickly and accurately, the makers point out. For further information address Cropley Instruments, Inc., 14 S. River St., Aurora, Ill. Mention of FLEET OWNER will be appreciated.

•

Guage Measures Ring Grooves

AN accurate tool of extreme simplicity for measuring the depth of piston ring grooves is now being offered by the Wilkening Manufacturing Co., Philadelphia, Pa., makers of "Pedrick" piston rings.

In presenting this gauge, the Wilkening organization points out that groove depths vary as much as .010



inch above or below the listed specifications. Production practice in the car factories allows for these tolerances, not only in the same engine, but in the different grooves of the same piston.

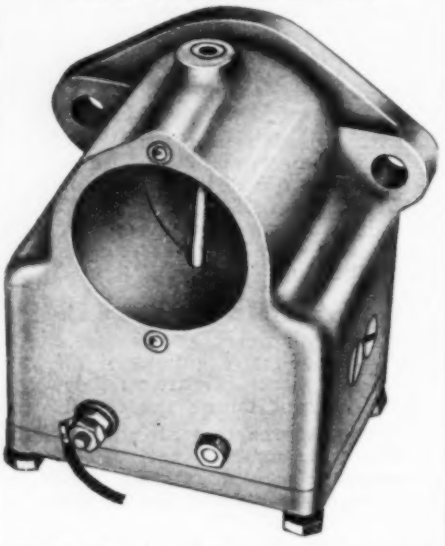
Furthermore, any car coming into a shop for a piston ring installation may previously have had replacement pistons installed with ring groove depths quite different from the listed specifications.

To use the Pedrick gauge, a steel straight-edge is placed along the skirt of the piston, as shown, and the gauge inserted into the groove, under the scale, until it bottoms. The reading on the gauge will indicate the depth.

The only safe way for the mechanic to be sure that rings of the proper thickness are installed is to measure the groove depth. This can now be done quickly and accurately with the Pedrick gauge. Each tool is made from selected steel, closely calibrated, with fractional dimensions etched on. The list price is 25 cents each.

•

Automatic Gas-Fume Eliminator



THE Messinger Valve, for all automotive engines, has been designed to eliminate gas fumes, smoke and odors, to save gasoline and oil and to prevent back-firing on a down-grade, among other claims.

Briefly, the valve consists of a spring-loaded butterfly valve, affixed in a cast housing, the latter of which is to be attached to the intake manifold. It is operated electrically, and when open causes a complete dissipation of the vacuum, inasmuch as the butterfly (approximately 2" in diameter) allows air to enter the manifold.

Operation is effected automatically immediately upon removing the foot from the accelerator. When decelerating, all vacuum in the intake manifold ceases to exist and the ignition is also cut off, so that the engine simply functions as an air compressor without losing any of its efficiency as a brake. When the vehicle comes to a standstill, or idling speed is reached, the ignition is automatically restored and the engine resumes its function without interruption danger of stalling, etc.

By eliminating the "high vacuum" during deceleration, the makers claim that the device will do away with objectionable "gassing" in addition to the above mentioned features. For full details and interesting literature address The Locke Steel Chain Co., Bridgeport, Conn.

•

Testing Outfit for Fuel Pumps

THE AC fuel pump analyzer, a new device developed by engineers of the AC Spark Plug Company, combines a flow and pressure test which gives an accurate analysis of a fuel pump under actual operating conditions without removing the pump from the engine.

This new device will be of particular interest to the fleet service field because it is a practical means by which a mechanic can accurately test a fuel pump. Prior to its introduction, no factory-approved means existed in the service field for accurately testing fuel pumps.

List price, complete information and special discount to the trade may be obtained directly from AC Spark Plug Company, Flint, Mich. You'll mention FLEET OWNER when writing, won't you?

Making a better finish for trucks . . . this is the Drying-Time Machine. On to a freshly-painted, revolving plate-glass disk flows a stream of sand. After the paint dries, the plate is turned upside down and tapped. Some sand drops off. A stiff brush removes more. From the adherence of the sand to the plate are calculated the points of varying dryness—the dust-free, tack-free, and final drying times. With this and other instruments every property of DULUX Finish is determined and checked with scientific accuracy.

WHIRLING DISKS AND FLOWING SAND

Sleek and bright are the delivery trucks of the John Wanamaker Stores in Philadelphia. They are finished with du Pont Automotive DULUX, chosen as ideal after severest tests in service. DULUX has been used for several years to maintain the brilliant color and smart appearance of about 145 vehicles.

JUST SIMPLE THINGS—a plate-glass disk that spins like a top . . . and some fine sand that pours out like icing on a cake.

But they are most important to you and to du Pont chemists. They are instruments in the du Pont System of Pre-Testing, designed to assure you of a smarter-looking, more serviceable and more economical finish for your trucks—*Automotive DULUX*.

This particular test is for drying-time. It is only one of many others. Every property of Automotive DULUX Finish must meet established high standards both in laboratory tests and in actual service. There's no guesswork here.

Many fleet owners have proved for themselves the superiority of DULUX. The John Wanamaker Stores in Philadelphia are one. DULUX provides a uniformly bright, glossy finish for their delivery trucks that keeps its smartness and brilliant color longer than any finish previously used. It is resistant to scratching, the harmful effects of gasoline and oil, and severe road wear. It permits a greater number of polishing operations without surface breakdowns. It makes possible important economies in refinishing and in fleet maintenance.

Assure these advantages for *your* trucks. Your own refinishing shop or an Authorized du Pont Refinisher can apply Automotive DULUX easily with spray or brush. If you desire, we will gladly help to work out standard DULUX specifications for your whole fleet. For further information, address E. I. du Pont de Nemours & Co., Inc., Dept. F2, Finishes Division, Wilmington, Delaware.

DU PONT
REG. U. S. PAT. OFF.

AUTOMOTIVE
DULUX
REG. U. S. PAT. OFF.

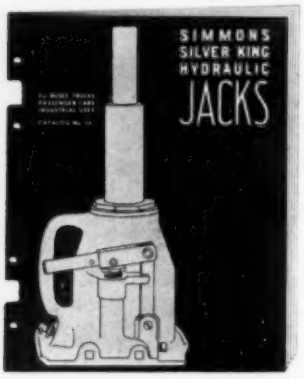
DU PONT MAKES A COMPLETE LINE OF AUTOMOTIVE REFINISHING MATERIALS

Say "I saw it in FLEET OWNER"—It Helps!

NEW STUFF *for* ROAD *and* SHOP (*Continued*)

New Silver King Jack Catalog

A NEW catalog which pictures and describes the compiete line of Silver King Hydraulic Jacks has just been issued by the Simmons Manufacturing Company of Cleveland, Ohio.



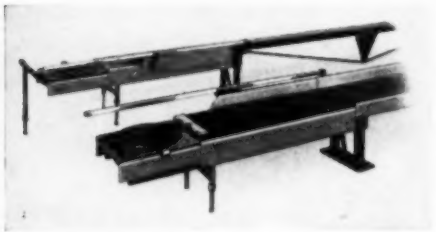
The catalog is arranged so that the proper jack for any specfic service can be found quickly. Detailed service information is included. A copy of this helpful catalog will be sent promptly on request to the Company.

•

Feragen Chassis Analyzer

A MULTITUDE of service jobs is possible with the new Feragen Chassis Analyzer—a new product in the Bendix-Feragen family of inspection and service devices. The analyzer will permit quick and accurate inspection of caster, camber, king pin angle, toe-in, chassis frame, front axles, rear axle housings and wheels (concentricity and wobble).

It serves equally well for wheel alignment corrections. Nothing has been overlooked in making it convenient, fast and accurate to work on. Full floating turntables and a "Wee Gee" board, both heavily nickeled, are built in level with the runways. The turntables have degree scales mounted on the outer edges and are also provided with means for a quick lock, when camber or caster is to be changed. Nickeled scale bars are used in conjunction with the chassis frame gauge for inspecting frames, axles, and rear axle housings. Means are provided to quickly raise or lower the front end of runways during camber setting operation, an exclusive feature.



The analyzer runways are 186 inches long—approaches 60 inches. It will handle a 172-inch wheelbase, with 60 inches to spare, when approaches are extended. With approaches folded up it takes no more space than an ordinary passenger car, 15½ feet.

Klemm Announces New Lubricant

THE Klemm Automotive Products Company, 2533 North Ashland Avenue, Chicago, Illinois, has developed a new product called Kapolene, a lubricating chemical compound. This lubricant is designed to revive the performance of old engines, facilitate the breaking-in of new engines and to permit easy starting and gear shifting in cold weather.

Kapolene added in the proportion of one to three parts to the regular crankcase oil prevents congealing at low temperatures and dissolves the gummy accumulations on valve stems and piston rings, giving a tuned up feel to the engine, it is stated. Also that Kapolene contains only those ingredients that improve the lubricating qualities of any oil. The product is being sold through the usual automotive channels.

•

Pedrick Piston Expander

THE new skirt expander and piston stabilizer shown here utilizes a new method of expanding a collapsed skirt and keeping it at the correct dimension for proper clear-

ance and efficient and noiseless piston performance. It is a product of Wilkening Mfg. Co., Philadelphia, Pa., makers of Pedrick piston rings.

The expander is a single spring steel wire formed in series of waves as shown in the illustration. Installation is made by cutting identical grooves in the two facing edges of the piston skirt formed by the split, then inserting the expander in the grooves, pulling it up from the bottom of the skirt with a pair of pliers. The invention includes a method and a special cutting tool for grooving the facing edges of the skirt along the slit.

One size expander fits all popular automotive-size pistons. *Thus it is available immediately for use in all makes of cars.* No weight is added to the piston. The amount of metal removed in grooving the skirt just about equals the weight of the expander. This is important not only because it prevents an unbalanced assembly, but because it does not nullify the prime purpose in using alloy pistons, namely, to decrease the weight of the reciprocating parts. Write for details if interested.

Toledo Pump Parts in Sets

THE Toledo Steel Products Company, manufacturers of valves, valve guides, chassis bolts and bushings and water pump parts, announce a new, improved method of packing Toledo Water Pump Parts in a complete set. All parts necessary for a thorough overhaul job on the water pump are packed in one strong carton.

These assemblies enable the operator to do a complete job and to improve the efficiency of the water pump. They are now available for the following cars: Pontiac, Nash, Whippet, Willys-Knight, Buick, Chrysler, Chevrolet, Ford, DeSoto, Dodge and Plymouth.

Complete details on these new assemblies are available on application to The Toledo Steel Products Company, Toledo, Ohio.

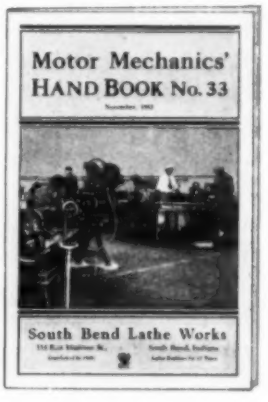
•

Handbook for Motor Mechanics

A NEW 32-page booklet showing precision methods for handling dozens of the major maintenance jobs encountered in the servicing of automobiles, buses, trucks and tractors has just been published by the South Bend Lathe Works and is being offered, free, to those interested.

More than seventy-five illustrations are used to demonstrate the practical manner for handling such lathe operations as replacing a flywheel starter gear, finishing round and cam-shaped pistons, truing a brake drum, testing and truing a crankshaft, reboring a rebabbitted connecting rod, handling valve work, truing an armature commutator, making and fitting special bushings and glands, replacing a differential ring gear, etc.

Other data shown includes information on selecting a lathe and shop equipment; equipments recommended for various sizes and types of shops; catalog descriptions of different types



of lathes. There are also descriptions of several free booklets available explaining individual servicing jobs.

A copy of this booklet, called Hand Book No. 33, will be mailed free to any reader who writes to the Technical Service Dept., South Bend Lathe Works, South Bend, Ind., and mentions the name of this publication.

150. **Worth More Than It Costs.** That's what we think of this free sample. Everyone seems to be having plenty of grief with tire chains this winter. Now you can repair broken cross-chains without the use of tools, and your drivers can do it right out on the road. Number 150 brings absolutely free a sample set of the well-known "Monkey Links." They're self-closing. The set you will get contains an assortment of three different sizes of links. It should be mighty handy just now. As the supply is limited, first come first served.

•

151. **Hang It On the Wall.** This attractive wall chart will help to cover up some of those unsightly brick walls that yours truly has seen in some fleet garages. But its usefulness does not stop there. It's an attractive chart that lists and prices a well-known line of replacement fenders. Besides most of the popular cars from as far back as 1924 to the present date, it also includes some of the more popular truck models as well. When you want new fenders in a hurry, the manufacturer suggests that you use your chart and get after your jobber. We suggest that you fill in No. 151 on our coupon below if you want a free copy of this wall chart.

•

152. **Not as Easy as It Looks.** Anyone can install piston rings. But there's a right and several wrong ways of doing this work. A manual that shows the proper types of rings to use for each engine, where to use oil rings, where to use expanders, etc., etc., has just been published, but it only covers passenger cars. If you have any Chevvies, Pontiacs, Plymouths, Fords, Buicks, etc., in your fleet you'll no doubt want a free copy of it. Get it by including No. 152 on the coupon.

•

153. **Good Jacks Save Your Jack.** Time lost on the road or in the shop because of inefficient jacks is very costly. Deaths and injuries due to defective jacks are even more costly. In our Question-of-the-Month survey on Jacks, it was disclosed that fleet operators, generally, prefer the hydraulic jack to the mechanical kind. What we started out to say is that you can obtain the latest Silver King Hydraulic Jack catalog by putting No. 153 on our coupon below. It's free for the asking.

•

154. **No More Jiggling or Shimmying.** We're not sure of the spelling, but you know what we mean. No doubt you have had trouble at some time or other with front end shimmy. Excessive wheel wobble, besides being annoying and dangerous, is ruinous to tires. And tires cost money. No. 154 covers literature on a new front-end steering stabilizer that is bound to banish front-end troubles forever, so they tell us. Further information, without obligation, can be obtained. 154 is the number.

155. **Free Refinishing Specifications.** Read this twice before putting down the number. If you would like to have a survey made of your fleet, without obligation, and individual refinishing specifications worked out to meet your particular requirements, Number 155 will bring further details. Since each set of specifications is made to order, there is no printed literature. This service promises to reduce to a minimum the number of days your vehicles need to be in the shop for refinishing. After you've read this the second time, and would like further information, indicate your wishes with Number 155, please.

•

156. **"Give Us a Better Joint."** This seems to be the "universal" plea of many fleet operators, especially those with heavy-duty units. An interesting book has been prepared in direct response to the demand for better universal joints. It illustrates and describes a brand new type of heavy-duty universal joint especially developed for the heavy-duty market. It's called "The Rzeppa Universal Joint in Transportation" and Number 156 brings it, free, gratis, for nothing.

NOTE:
Literature listed here is all "Hot Off the Press" and is guaranteed to be of interest to fleet maintenance men.—H. C. F.

157. **Not a Fly-Swatter.** Although it will deliver a clean blow without injury to the surface struck, it is not recommended for swatting flies on the boss' bald head. It is recommended, however, for driving bushings, ball bearings, piston pins; for pounding stubborn tires off rims; for light machine shop operations; and for all other uses where a soft-faced hammer is demanded. An interesting circular that illustrates and describes an even more interesting line of rawhide-faced hammers will be sent to those requesting Number 157. And, which is more important, the rawhide faces are renewable at a very small cost. Number 157, if you will.

WHAT DO YOU READ?

HERE'S a hand-picked assortment of literature that is offered to you entirely without obligation.

We've even made it easy for you to get it. Fill in the coupon below, mail to the Editor, and let us do the work. We'll ask them to send it at once and not to bother you with salesmen, either.

158. **How to Reduce Oil Costs.** Get out your cost sheets and check up on how many gallons of oil you used last month. Figure what it cost you in dollars and cents. Then sit down and fill in the coupon below, if you are interested in cutting those very figures right in half. If you are skeptical, Number 158 will bring you full information to back up the claims of this refiner of high grade motor oil. And you needn't feel obligated to buy anything, either.

•

159. **Volt-O-Matic.** A new word, intended to mean, we presume, automatically controlled voltage. With this new generator a heavy charge is put into the battery when the drain is heavy; automatically cutting down the current supply as the battery becomes charged. An interesting booklet, "Volt-O-Matic Generators," explains the subject much more thoroughly than we can do it here. Number 159 on the coupon makes it easy to get a free copy.

The Editor, FLEET OWNER, ...1934
90 West St., New York, N. Y.

Kindly send me without obligation, the following free books mentioned in the.....issue. (Literature will not be sent unless firm name is given.) Order by number.

....

....

Firm Name .....

Address .....

City and State .....

Your Name ..... Position .....

QUESTION *of the* MONTH

"By far, one of the most valuable departments to be found in any automotive publication. Every fleet man should be delighted to cooperate."—A Reader

Here are Some of the Most Interesting Replies to Question No. 39:

Big Bus Fleet Does Own Radiator Work

"THE only thing in radiator work that we farm out to other shops is the recoring of radiators. All other repairs are done in our own shop. We have a water tank and the usual soldering equipment for this work. When replacement is necessary, we do not replace the tanks—only the cores.

"Standard equipment in radiators is found adequate for our purpose. Our most common radiator trouble is due to lime in the water, which clogs things up. We flush radiators regularly and use a neutralizing acid when necessary. Radiator replacements are secured from truck dealers and automotive jobbers.

"We are using various kinds of winter protection, such as shutters, cardboard shields, covers, thermostats, etc. The thermostats have given us some trouble and we have removed a few. However, these devices have saved us money in fuel costs. They also make for warmer buses when equipped with hot water heaters. There is also a saving in anti-freeze.

"We do not use anti-freeze in the buses, but we do use it in our passenger cars. For keeping radiators clean, we circulate a cleaning compound when needed—usually three or four times per year. We first use a solution to remove grease and then an acid to neutralize the lime."—*C. A. Martin, Supt. Maint., White Star Lines, Inc., Washington, Pa., operating a fleet of* 102 *buses and* 4 *passenger cars.*

●

Alkali in Water is Not So Good

"WE make all of our own radiator repairs, having complete equipment for this purpose, such as brazing torches, dipping and flushing tanks, testing equipment, soldering outfits, etc. When replacement is necessary, we replace tanks as well as cores.

"Our source of supply on radiator replacements is a radiator manufacturer. We do not find standard equipment radiators adequate for our requirements. Our most common troubles with radiators are due to corrosion of the cores and tanks, caused by alkali in the water. This causes leaks and deterioration of the metal, and it seems to be general in all makes of vehicles that we use.

"For winter protection we use automatic and hand shutters and water thermostats, which give very little trouble. We have removed some of the thermostats, however. With this equipment our motors do not have time to cool off, from the time they start in the morning, until they return to a warm garage at night.

"As an anti-freeze we are using alcohol. For cleaning radiators we use a power gun with a strong alkali solution, cleaning from the bottom to the top. This is sometimes done with the radiator on the vehicle; sometimes removed from the vehicle."—*G. H. Cleaver, Supt., American Stores Company, Philadelphia, Pa.*

●

Does Minor Repairs; Farms Out Major

"VERY little of our radiator repairs are done in our own shop. We just solder up the small leaks with an electric soldering iron when necessary. The major radiator repair work is farmed out. Radiator replacements are obtained from truck dealers and jobbers.

"Our most common radiator difficulties are caused by corrosion from years of usage. We prevent this as much as possible by constant draining, cleaning and flushing. When they are badly clogged, we remove them and send them to a radiator shop to be thoroughly cleaned.

"For winter protection we use cardboard shields. The water thermostats gave plenty of trouble and we have removed all of them. By keeping motors warm we get better general operation, improved acceleration and more miles per gallon of gas. We use Zerone anti-freeze in our trucks."—*J. D. Zerbo, Cost Accountant, Strietmann Biscuit Co., Cincinnati, Ohio, operating a fleet of* 28 *trucks.*

●

Vibration Causes Radiator Grief

"OUR radiator repair work is farmed out to a radiator repair shop. However, we remove and reinstall them in our own shop. Replacement of cores is not necessary on most of our radiators, as they have cast iron and aluminum tanks. The truck dealer is our source of supply on radiator replacements.

"Standard equipment radiators we have found to be adequate for our operations. Our most common radiator troubles are caused by tubes loosening in the headers, due to vibration. There is not much that can be done in the way of correcting these troubles. Our line of work is pretty hard on radiators, with this type of truck. (Mack)

"For protection against cold weather we are using manual shutters; also tin shields. Thermostats in the water line do not give much trouble; we have only had to remove one defective one so far. We find this sort of protection necessary, as the motors are not efficient when run cold.

"We do not use anti-freeze in trucks, but we do use some in the passenger cars. When radiators become clogged, we have them boiled out, and the tubular types are 'rodded,' particularly on Mack trucks."—*G. Harmston, Shop Supt., Frenzel Bros. Co., Chicago,*

A FEW RADIATOR EXPERIENCE REPORTS (*Continued*)

Ill., operating a fleet of 19 *trucks and* 12 *passenger cars.*

●

Here's a Good Cleaning Method

"RADIATOR repairs are not performed in our shop, but are farmed out, as we do not have any equipment for this purpose. Our source of supply on radiator replacements is the truck dealer. We find standard equipment radiators adequate for our operations.

"We find that honeycomb radiators rot out first, but this does not happen until they are about three years old. We haven't taken any steps to correct this, as we really have very little radiator trouble.

"As for winter protection, the only thing we use is thermostats, and those only where they are furnished as standard equipment. We have had no trouble with thermostats and have not removed any.

"We use anti-freeze in all of our vehicles. Our radiators are kept clean by using 1½ ounces of Oakite Test X to one gallon of water. Let the engine run hot for 15 minutes and then flush out."—*Dwight H. Woods, Engineering Asst., Nashville Gas & Heating Co., Nashville, Tenn., operating a fleet of* 21 *trucks,* 9 *passenger cars and* 3 *other vehicles.*

●

Good Bumpers Will Save Radiators

"ACCIDENTS in city traffic are our chief cause of radiator troubles. To remedy this condition we have installed good bumpers. For winter protection we use cardboard shields, leatherette covers and Prestone anti-freeze.

"We make our own radiator repairs; replacements are obtained from the truck dealers. Cleaning is done in the spring and fall, with a strong soda solution. We find standard equipment radiators adequate for our operations."—*H. Sunderman, Fleet Manager, Stahl-Meyer, Inc., New York City, operating a fleet of* 97 *trucks and* 30 *passenger cars.*

(Please tear out and mail to The Editor, The Fleet Owner, 90 West St., New York City)

Question No. 41—Piston Rings

On new vehicles, when are piston rings replaced for the first time? (Mileage or time period)
Pass. Cars ..... Light Trucks ..... Heavy Trucks ..... Buses .....

What is your average mileage per set of piston rings? (Please indicate below)
Pass. Cars ..... Light Trucks ..... Heavy Trucks ..... Buses .....

How many times do you change piston rings per set of pistons? (Please indicate below)
Pass. Cars ..... Light Trucks ..... Heavy Trucks ..... Buses .....

What are the symptoms calling for piston ring replacement? .....
.....

At what mileage is it necessary to recondition the cylinders? (Please indicate below)
Pass. Cars ..... Light Trucks ..... Heavy Trucks ..... Buses .....

What method is used for cylinder reconditioning and what machine? (Please indicate below)
Regrinding..... Reboring..... Honing..... Others.....

Do you sometimes cure oil pumping and piston slap by the installation of piston rings without reconditioning the cylinders? .....

If so, what make or type of ring is used for this purpose? .....

About how many sets of rings are used, per motor, before it becomes necessary to recondition cylinders and fit new pistons? (Average figure) .....

What make or type of piston ring has been most satisfactory for general replacement, when the engine is not in bad condition? .....

When cylinders are reconditioned and new pistons fitted, what make or type of piston ring gives best results? ....
.....

How often do you perform complete major engine overhauls? (Please indicate below)
Pass. Cars ..... Light Trucks ..... Heavy Trucks ..... Buses .....

What is your source of piston ring supply? (Please check below)
☐ Vehicle Dealer; ☐ Vehicle Mfr.; ☐ Jobber; ☐ Ring Manufacturer; Others .....

Remarks .....
.....

We operate .....Trucks; .....Buses; .....Pass. cars; .....Other Vehicles

Note: If you cooperate with us and fill out this questionnaire, you will be entitled to a tabulated report covering all of the answers.

Swap your Maintenance experience with other fleet operators in this easy, convenient way. We do the work. You get the benefit.

Name of Firm .....
Address .....
City and State .....
Your name .....*Position*.....

SELF-MAINTENANCE ASSURES EFFICIENCY (*Continued*)

knowledge of the individual requirements that a company is operating under. Too, in outside service station work, the operator is deprived of that privilege which he can enjoy in inspecting parts removed in order that they might be used over again with a fair margin of safety because of his individual knowledge of the requirements of each vehicle.

This matter of mechanical efficiency does not stop with the efficiency of the coordinated units by any means; it must be carried throughout the entire stage of productivity, and must bring back at the end of a day, a dividend, and unless it does bring back a dividend, you are going to be two paces ahead of the sheriff.

So, mechanical efficiency extends clear over the entire productive life of each vehicle, and to get the maximum service out of the vehicle, your personnel must be thoroughly trained and thoroughly acquainted with your individual problem. That can not, and has not, in my experience, been the case with outside service stations.

Take, for instance, the question of equipment—tools, dies, fixtures, etc. Special fixtures are a thing of the past. One thing that has made them a thing of the past is that the change of models with the various manufacturers is so rapid that before they can get out a line of fixtures, they are obsolete. But there is now a standard line of fixtures.

It has been my privilege to go into some of the largest service stations in the Metropolitan area and from here to the West Coast. What do I see? A standardized fixture that will take a "B" a "K," or what-have-you. That old argument of individual line fixtures and tools and dies for individual models was hung years ago.

Tell me of a service station that rewinds its own armatures. None that I know of. The intricacies of specialized service are the same whether you operate your service station or whether you go to the outside service station. They send all specialized equipment to specialists, and justly so. It is true that the efforts of the specialist have enabled us to enjoy lower maintenance and operating costs.

Let us consider major repairs. Major repairs, gentlemen, are a relatively small percentage of total mechanical cost. Analyze your own mechanical personnel department and you will find that 60 per cent of the men on your payroll are men who are doing a "stitch-in-time-saves-nine" after the vehicle comes in from the route. That 60 per cent of your personnel, whether you have outside work or not, must be maintained in your own bailiwick. Take the question of mechanical efficiency again. Mechanical efficiency only depends on, in my opinion, about 30 per cent of the major units in the automobile. I want to drive this point home in relation to that figure I have just given, that 40 per cent of your payroll costs is only for major repair work.

When it comes to the major repair work, I think we all heartily agree, from our own experience, that the major parts cost just about balances the cost of labor. In other words, throughout the general scheme of repair, not in individual cases, if you spend $60,000 a year in parts, you will spend approximately $60,000 a year in labor for the installation of those major parts. Therefore, the parts item is quite an item when we come down to maintenance outside versus inside.

But if you take the same engine that would need $20 worth of parts, and send it to an outside service station, you pay from 15 to 25 per cent more for your parts outside than you pay in your own service station. That is a matter of record. That is an item you must remember. If you spend $100,000 for parts in your own shop, and you decide to send the work out and let someone else do it, you are going to give them $125,000 for the same parts. Also, you are going to deprive yourself of the privilege of re-using perhaps a high percentage of those major overhaul parts that make up your integral units.—(ED. NOTE: We were not aware of the fact that parts discounts are different when they are installed by the dealer, than when sold without installation. That's a new one to us.)

The question, of course, in everyone's minds in transportation is dollars and cents. It always comes right down to that basis. But in mechanical efficiency, there is a point that cannot be weighed absolutely in dollars and cents, because it is a very intangible item, and that is convenience—the ability and the privilege of having those vehicles which, we will say, cost $5,000 each, or a total investment of $3,000,000, under your direct supervision; when you let that go out, you have lost individual control of that $3,000,000 insofar as its application to mechanical repair is concerned. I have taken into consideration in that figure the asset value of each vehicle.

If we have our work done outside or inside, we must maintain a stockroom, and what does that stockroom mean in dollars and cents? To us, it means five dollars per vehicle per year in cost. Our stock consists of approximately four thousand items, for the convenience of doing our work after the driver has come in at night, because that vehicle may be rendered useless the next day because of the absence of a little spring, or a little gadget that only costs fifteen cents. So, we must maintain those parts items. We endeavor, at the request of the manufacturer, to reduce our stock inventories. We also find that he has done likewise.

Let's get down to the bug and get it out of the chip. If at any time we can save money in eliminating our service station, or our repair shop, isn't it perfectly ridiculous for us to arbitrarily say, "No," because we are solely dependent as truck operators on the ability of each truck to earn for our existence. So we have some very convincing arguments on it.

Several years ago, I went over to one of the finest service stations, and they gave us fixed charges for this operation, that operation, and the other operation. I reminded the service station manager at the time that he wasn't as gifted as yet with that power of looking into an engine and saying, "Well, that bearing should be changed, or should not be changed." To make a long story short, we dropped our major repair work and sent it to this service station. I wish it were ethical that I could tell you the name of the station. The cost over that period of three months on major repair work was an average of 27 per cent higher than our departmental labor cost applied to that job.

On our service station work, we take the departments separately and treat them as if they were an outside company. We do not charge the rent of the garage, or the area of the garage, the plant and structure account, the light, heat or the power account. We apply the direct overhead, not like some of the outside service stations do, where you pick up a statement and see where they have had to carry over to the

(*Please turn to page* 42)

Motorcycle Dealer Turns Fleet Operator

(*Continued from page* 18)

cept Sunday, and the parade, with drivers and attendants in snappy uniforms, for the first block resembles the motorcycle lineup of a big motorcycle police force. A large crowd of spectators always gathers to watch them. The return of their cars is not so impressive as they come in by ones, twos, three and fours at all hours of the day and night.

This business has shown a constant increase during the past nine months. The additional orders for machines sent to the Indian Motocycle Company by the Sterns have convinced the Indian people that they have found an added use for their product which bids fair to prove of great importance, as the Six Stern Brothers idea is being copied in other cities throughout the country, officials of the company point out.

●

Servicing Cam-and-Lever Gears

(*Continued from page* 22)

condition, but will shorten the life of the gear and impair its operation because it will not permit of a lubricating film between the working parts.

21. When the proper adjustment has been made, tighten the lock nut (9) and test the gear before leaving this operation, as tightening the lock nut may change the adjustment slightly.

22. Toward either end of the cam the end play will increase because the groove in the cam widens, thus permitting the stud to ride deeper in the groove. If the front end of the car is in proper condition this will not affect the steering. This increased end play in the extreme positions is not objectionable because the speed of the car must be decreased to negotiate sharp turns, and the greater play off mid-position is not noticeable at lower speeds.

23. Make sure steering gear ball arm (2) is tight on the splined shaft and that the lockwasher and nut (7) are tight also.

Clamp Gear in Car

24. Tighten adjusting plug clamp bolt or dash bracket clamp (par. No. 9). Turn wheel to see if the gear turns harder. If it does the steering column is out of alignment. In that case proceed as follows:

(a) Loosen dash bracket (and if necessary) frame bracket, and align gear. It may be necessary to shim the dash bracket. Do not spring the steering column to the bracket.

(b) See that frame bracket is tight to frame.

(c) See that gear is rigidly clamped in frame bracket so that it does not spring when the wheel is turned (when the drag link is connected and wheels are on the ground). Bracket must not be clamped so tight as to bind the gear, however.

(d) Test gear to make sure that tightening the brackets has not caused the gear to bind.

Connect Gear to Front Wheels

25. Turn the steering wheel as far to the right as possible, then rotate the wheel in the opposite direction as far as possible and note the total number of turns. Turn the wheel back just one-half of this total movement, thus placing the cam lever in the mid-position. Place the front wheels in position for straight ahead driving. It should then be possible to connect the drag-link to the ball on the end of the steering gear arm without moving the gear to any appreciable extent

(*Please turn to page* 42)

Maintain the Efficiency
of the
BASA HAMMER
at small expense
With Rawhide Refill Faces

BASA FACES can be depended upon for uniform durability.

The Rawhide Face is a vital part of the Hammer, and, for that reason, only first-quality hides are used.

The BASA Hammer with removable Rawhide Faces can deliver a light or heavy blow without leaving a trace of damage.

Expert workmanship is employed in preparing the Rawhide Faces used in the BASA Hammer, which have the proper firmness and resiliency to strike a blow that will not dent or mar a finished surface.

Each of the five sizes of the BASA Hammer has the proper balance to strike a measured blow.

WHEN WORN, RAWHIDE FACES CAN BE QUICKLY RENEWED AT SMALL COST.

Copper and babbitt faces furnished if desired.

The BASA Hammer makes possible faster and more efficient work around the repair shop.

Inquire of your dealer, or send to us direct for full particulars.

Illustrated folder sent upon request

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Schrader Dublchek is a secondary air-seal. Air shoots right through cap into tire—but it can't get out. Nothing to unscrew or replace. Also protects inner valve against dirt and damage. In sets or quantities.

Schrader Valve Cores are standard of the tire industry—have been since the birth of the automobile. Rugged, long-lived, sure-sealing—constructed for heavy duty. "Be sure it's a Schrader—look for the name."

Little items that mean big savings in tire mileage and better maintenance of operating schedules

WHEN tire trouble throws your operating schedules out of gear, think twice before you lay it to the tires. More often than not the trouble is due to improper inflation or neglect. Incorrect air pressure wastes the mileage and dependability that is built into tires today. Schrader Dublcheks and Valve Cores make it easy to keep truck and bus tires properly inflated.

Correctly inflating tires before leaving the garage is important. But guarding against loss of air while en route is equally so. Both precautions help mightily not only in avoiding time and tire-mileage waste, but also customer complaints about delays.

Keep your fleet equipped and well serviced with Schrader tire-valve necessities and save m-o-n-e-y. The cost is trifling; the savings are large. Worn or damaged valve cores should be replaced with fresh Schrader Valve Cores. And when valve stems are then equipped with Schrader Dublcheks, tire inflating becomes "easy as pushing a button." Service-man or driver neglect is reduced to a minimum.

Get in touch with your regular source of supply and learn what Schrader Dublcheks and Valve Cores can do for you. A. Schrader's Son, Inc., Brooklyn, N. Y.; Toronto, Can.—*Makers of pneumatic valves since* 1844.

Schrader

Reg. U. S. Pat. Off.

TIRE-SAVING VALVES, CAPS AND GAUGES

Servicing Cam-and-Lever Gears

(*Continued from page* 41)

(in most cars the steering arm will hang vertically). If this cannot be done remove the arm from the steering gear and place it on the splined shaft in the proper position. This is extremely important as any other position of the arm will change the effective ratio obtained from the gear. It is also important in order to obtain full throw of the front wheels equally to the left and to the right.

26. Refill the steering gear housing with recommended lubricant.

●

Self-Maintenance DOES Assure Efficiency

(*Continued from page* 40)

deferred account, and set up an equalization charge to offset a $175,000 deficit for the operation of their service station. The customers would pay for it; whether they pay directly for it in the individual charge is not a point.

So far as dollars and cents is concerned, there is no question but that it is more efficient and economical to maintain fleets in sizes of 50, operating in a concentrated area of a fifteen-mile radius. Below that, consideration should be given to outside maintenance. There is no question about those two things in my mind.

Again I want to drive home that the cost of major repairs is a very small item of total maintenance; but that assurance of having it under your control, in order that your vehicles might go out the next day and bring in dividends, is worth three or four-fold the cost of operating your shop from a major standpoint. And, remember, you are paying 25 per cent premium for parts that go into the vehicles on outside service station work. If a man can go into a fleet from a mechanical standpoint and save even ten per cent, there is something wrong with the efficiency of the mechanical department. There is but a small margin, gentlemen, when it comes down to the mechanical cost versus your total cost.

What is one going to do when a driver leaves in the morning, and you give him six thousand dollars worth of truck and say, "Big boy, go out and get this case, but for God's sake bring me three per cent on my investment." He may bring you back a twenty per cent minus. That is a hazard. He goes out and has an accident, an accident that does not wholly deplete his performance of duty. For instance, hitting an elevated pillar, and his radiator drops back below his fan but he may pull out and continue his day's operation. Are you going to bring that into the plant of the customer, and take it over to John Smith's a mile and a half away to have a half hour's work done on it? No; you are going to continue that service in the light of day, whether you have your work done outside or inside. That must be maintained.

●

Outside Maintenance Assures Efficiency

(*Continued from page* 25)

service station, if located nearby, will take longer for a given repair. Often, in fact, due to the larger volume of work going through, the greater specialization of equipment and personnel and the better organization of the work which large-scale operation permits, the

manufacturer's service station is able to beat the time of the home shop without recourse to unit interchange. Also, in many operations, by reason of spasmodic flow of trucking volume, proper planning in advance can avoid the necessity of so much hurry.

Claims of economy in self-maintenance are often subject to some question in consideration of the peculiarities of accounting sometimes practiced. The investment involved in the buildings, equipment and stock of a maintenance plant capable of performing the bulk of the maintenance work for a large fleet is great; as those operators who are responsible for them know.

If the work is to be done efficiently and cheaply, quickly and well, then for each operation more or less elaborate equipment must be provided, even though the volume of each kind of work is small. A cylinder grinding outfit, which in a fleet of 100 vehicles might be called upon to work to a few days per year, costs more in overhead than its twin brother in the manufacturer's service station, which works 300 days a year.

Low final cost of work is not consistent with high unit overhead. I strongly suspect that where the figures fail to show this up, the proper separation of shop overhead from the general accounts of the house has in many cases been overlooked. With such testimony as given by Mr. Lyon, of course, there can be no such difficulty, because motor haulage is his whole business. There are no unrelated general accounts in which to confuse overhead items and the heads of his company have been associated with it too long to come under the suspicion of making a showing by skimping the quality of the work done.

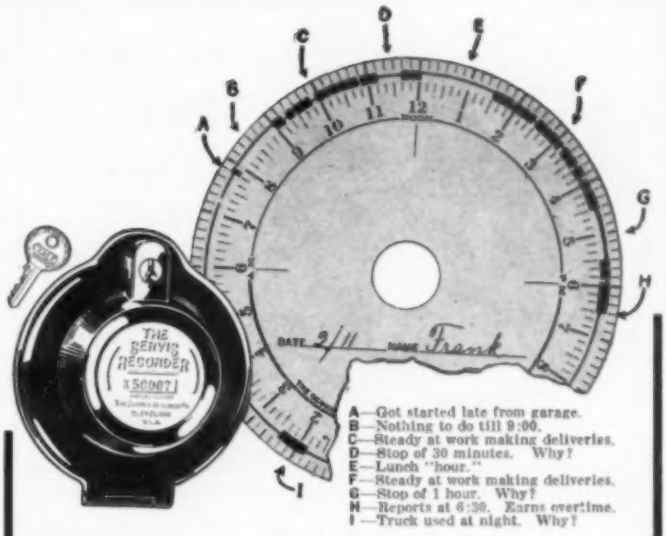
How many other operations are there so favorably placed as to size, concentration, standardization, restricted operating range and competence of management? In settling down the factors which would indicate self-service as the best policy, I was conscious of practically describing the Motor Haulage operation. They are:

Large fleet—200 or more vehicles.
Concentrated in one location.
Standardized on a few makes and models.
Operating range restricted to immediate vicinity.
High continuity of operation—non-seasonal.
Highly-developed maintenance system—preventive—unit overhaul system.
Accounting system designed solely to present required picture.
Competent management and personnel—specialists in motor transport.

On the other hand, it would not be difficult to picture another type of operation, even with a fleet of equal size, in which self-service would be an exceedingly questionable procedure. Such would have such characteristics as:

Same size fleet, but:
Vehicles scattered in small groups over a wide area.
Each vehicle operating on long routes, taking it long distances from its home garage.
Fleet composed of heterogeny of makes and models.
Volume of haulage subject to seasonal fluctuations.
Maintenance precarious—mostly remedial because shops are too small to organize on preventive maintenance basis. Scattered location makes large central repair depot impracticable.
Overhead items and supervision lumped for all departments in general accounts. No isolation of truck maintenance items possible.
Trucks under management of local managers with little experience or interest in motor transport.

(*Please turn to page* 44)


THE SERVIS RECORDER
DATE 2/11
NAME Frank
A—Got started late from garage.
B—Nothing to do till 9:00.
C—Steady at work making deliveries.
D—Stop of 30 minutes. Why?
E—Lunch "hour."
F—Steady at work making deliveries.
G—Stop of 1 hour. Why?
H—Reports at 6:30. Earns overtime.
I—Truck used at night. Why?

What's Your Truck Doing All Day?

This Little Device Tells Every Move the Truck Makes

SEE THAT CHART. Those wide heavy marks show just when your motor truck was working, and how long. In between are blank spaces that show idle time. The result is a complete record, in fact, a "picture" of just what your truck did all day and all night. The truck "writes" its own story. Simple, isn't it?

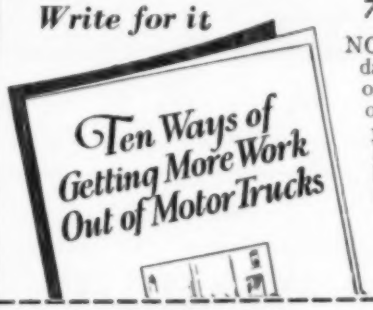
Save $500 Per Truck Per Year

Motor trucks are expensive to operate. The running time of a truck costs from $3.00 to $5.00 an hour! That's why delays, *avoidable* delays, are so costly. Half an hour per day *avoidable* idle time easily costs you $500 per year. It's a big loss. That's why over 100,000 trucks are already *Servis Recorder* equipped.

All You Need Is a Screw Driver

The little *Servis Recorder* that produces this "Busy-Idle" chart is attached to the truck merely by a couple of screws—why, you could even *nail* this *Servis Recorder* on your truck.

Write for it



7-DAY Model

NOW you can get a 7 days' busy-idle record on a single chart without changing. When you lock the 7-Day Recorder, you don't have to touch it again for a week! The coupon brings the whole story.

THE SERVICE RECORDER CO.
Hanna Bldg., Cleveland, Ohio

Please send us, without obligation, "10 Ways of Getting More Work Out of Motor Trucks."

Company .....
Attention of .....
Street .....
City & State .....

The Service Recorder Company
Cleveland, Ohio

THE SERVIS RECORDER
"Keeps Trucks Busy"

The NEW
SPOKE
CELORON TIMING GEAR
IMMEDIATELY AVAILABLE
From
NAPA WAREHOUSES AND DISTRIBUTORS

SPONGEX
(Sponge Rubber)
Honeycomb Cushions
for truck and bus seats
A New Way to Ride on Rubber
Write for booklet today
THE SPONGE RUBBER PRODUCTS CO.
Derby, Connecticut

A complete line of superior quality axle shafts for all makes and models of passenger cars, trucks and buses. A special engineering service to study your individual problems is available to all responsible fleet operators.
Write for complete information
The U.S. Axle Co. Inc., Pottstown, Pa. U.S.A.

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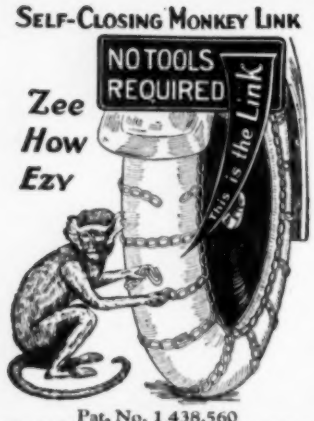

Zee How Ezy
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WHY BUY New Chains ?
Repair Them With Self-Closing
MONKEY LINKS
Carry them on your trucks and busses. Your driver can make instant repairs—no delay. No tools required. Insures safe driving at all times. Fits all tire chains.
Flower City Specialty Co.
ROCHESTER, N. Y.
At All Reputable Jobbers

Shop personnel of low grade—no specialists.

Such operations cannot justiably pursue any other policy than dependence upon manufacturers' service stations for the greater part of their maintenance, relying upon a qualified superintendent of motor vehicles to co-ordinate purchase, operation and maintenance in the various localities.

How many concerns using large numbers of typewriters, for example, attempt to maintain them in their own shops, with their own mechanics? Do big department stores, using many hundreds of cash registers dispense with manufacturers' service? Do the insurance companies with their extensive calculating machine equipment use self-maintenance? The size of the equipment alone is not sufficient.

There was a time when self-maintenance was a more practical policy for numerous operators than it is now. When maintenance was principally remedial rather than preventive and periodic general chassis overhaul was predominant, large fleets could so plan the overhaul work as to keep a complete set of shop departments supplied with reasonably constant work and could perform a general chassis and body overhaul in a minimum of time and often most economically.

Today, however, with unit overhaul decidedly in the ascendancy among large fleets the elaborate shop equipment required for the general overhaul is no longer necessary; for aside from running repairs lubrication, inspection and adjustment, it is merely necessary to have suitable facilities for unit interchange to achieve the minimum time out of service, relegating the unit overhaul work to the manufacturers' service stations.

This, of course, presupposes that the manufacturer has provided a service station conveniently located to the operators' shop, which is equipped and manned for the work and so efficiently managed as to afford the requisite promptness, thoroughness and fair charges; a matter which merits the operator's careful analysis before laying down a maintenance policy and each time vehicles are purchased.

This constitutes another determining factor, the importance of which cannot be overstressed. Circumstances certainly do alter cases in this respect, so that it is utterly impossible to determine the extent to which it will be advantageous to make use of the maintenance service offered by the vehicle builder without considering the quality of service which he offers, in each instance.

However, it should be understood that the extent and quality of service offered by the manufacturer is affected in some degree by the attitude of fleet operators. Every operator who sets up his own maintenance plant, duplicating the facilities and operations which the manufacturer is obliged to provide for the small operators in his territory, reduces the scale of operations of the manufacturer's service station and to that extent its ability to serve the fleet operator as well as other operators.

It is a foregone conclusion that even in the larger centers, greater patronage of the service station by the fleet operator results in better service being given. Manufacturers have endeavored to anticipate this logical result in many instances, by providing the service in advance, on a gamble, in expectation of demand. In some instances, unfortunately, they have been left holding the bag by the withdrawal of patronage by large fleet operators, due to changes in maintenance or purchasing policy. It is important for the fleet operator to keep in mind the fact that fleet maintenance of the best kind is a co-operative enterprise. It is important

to make sure that the manufacturer is able and willing to co-operate and then to whole-heartedly co-operate with him.

There is much abuse of the fleet discount on parts by which some false conclusions relative to self-service are drawn. The only fair basis for a fleet discount on parts is the purchase by the user of parts in sufficient quantity and in sufficiently large lots to actually reduce the manufacturer's handling charges and costs of sale. This particularly applies to those parts which are required with less frequency, in other words, the slow turnover parts.

Our company, for example, very seldom sells a crankshaft or timing gears, yet we must carry them in stock in all of the sizes required by the various models in operation in each territory, including the chance visitor from a neighboring state. Fleet owners who carry such parts in their own stock are certainly entitled to some consideration. Other parts, which turn over frequently, such as pistons and rings, valves, chains or brake drums are the type which operators are most likely to carry in stock. Yet it is these very parts which the manufacturer can handle most economically, so that their stocking by the operator is of the least relief to him.

The way it works, then, is this: By stocking principally fast-moving parts, even where he buys the vehicle part from the manufacturer, the fleet user does not really earn a discount, though for policy reasons he frequently gets it. The parts on which a discount would be worth the manufacturer's while — the slow-moving ones—are not usually stocked; but are dispatched special delivery in an emergency, notwithstanding which a discount is demanded. All well and good from the operator's point of view, so long as he can get away with it. His books show a saving.

Too often, however, upon adopting a policy of nearly complete self-service, it is assumed that the same saving will be realized on a complete inventory in the operator's own stockroom; only to find that the carrying charges on the slow-moving parts more than eat up the discounts.

Unless self-service is carried out on a grand scale, many of the expected economies will not be realized. This is sometimes due to disproportionate overhead involved in those jobs which account for but few hours while requiring considerable floor space and equipment, such as cylinder grinding equipment, radiator repair facilities, transmission overhaul appliances and so on.

It is sometimes the result of inefficient workmanship due to demanding too much versatility of mechanics, who must be jacks of all trades and masters of few, if any. It is difficult, if not impossible, for the small shop to keep abreast of improvements in tools and methods and for the small stock-room to avoid obsolescence of inventory—particularly the slow-moving parts.

This limitation does not apply to the small service station because it is, or should be, a branch of a chain which in many cases constitutes a part of a total service plant larger than the factory producing the vehicle. It is often difficult for the operator's shop to accommodate itself to fluctuations in volume of work, whereas the service station, because it is a part of a chain, may call upon others which are experiencing slack periods for assistance.

There is danger, too, except where the operation is standardized on a single make, of standards and technique adapted to one product being misapplied to another to which they are wholly unadapted. Needless

(*Please turn to page* 46)

HALF the money you spend for oil is THROWN AWAY!

You actually throw away 40¢ to 60¢ out of every dollar spent for motor oil when you discard crankcase drainings—for the oil drained from your motors is every bit as good as the oil put in. The difference, as far as lubricating qualities are concerned, is due to the accumulation of grit, carbon, gasoline, etc.—foreign matter that can be thoroughly removed with a SKINNER OIL RECLAIMER at a cost of approximately 2¢ per quart.

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2500 ROOMS — $2.50 UP
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to say, this can not happen in a service station, devoted to a single make.

Human hazards also obtrude, such as the temptation for the superintendent to go too far in the scope of his operations for the sake of building up the importance of his own job. There is the lack of competitive urge which keeps the service station on its toes. The self-maintenance shop has a monopoly. Manufacturers' service managers are painfully aware that they have not.

With his preoccupation with the individual peculiarities of a single operation, there is danger of too narrow an outlook for the superintendent, a tendency to devote a disproportionate amount of his time to details of shop management, to the detriment of such outside conditions as the efficiency of operation, routing, dispatching and so forth. In some cases, indeed, the needless isolation of a self-contained shop has led technically-gifted operating superintendents to turn maintenance shops into experimental laboratories and parts factories, whereby the firm's money is spent in useless, crude and often misguided development work, long since tried and rejected by the manufacturer.

This, of course, is a dark picture. It is painted not as a reflection of inevitable consequences of a self-service policy, for we are all too familiar with too many splendidly-efficient owner-maintenance plants to doubt that where appropriately-conceived and ably managed, these plants are abundantly worth while. The purpose, rather, is to point out some of the less obvious pitfalls which beset the path of the organization which too readily jumps to the conclusion that what is good for such as these, must of necessity prove equally advantageous for its own.

In resting the case for the negative, I wish to say one further word about the attitude of progressive manufacturers on this subject. Service activities are not engaged in from choice; but from necessity. The motor truck business would indeed be a sweet one if trucks could be built and sold with as little concern for maintenance as is the case with shoemakers, building contractors or furniture manufacturers. If all motor truck buyers were fleet operators, then trucks could be built as locomotives are—without a thought or care for maintenance and without the necessity of one dollar's investment in service stations or local stockrooms.

But the motor truck is a machine of such intricacy, such responsiveness to differences in operation and care, and withall so terribly racked and strained and abused in average operation, that the moral as well as the business responsibility of the maker cannot end until it rolls out its last of so many, many thousands of miles and starts upon its journey back to the melting pot from which it sprang.

The average fleet is still less than two trucks or eight buses. It is the thousands of individual truck purchasers who make satisfactory and efficient trucks available to fleet buyers. The manufacturer is bound to provide service—complete service—for these thousands, regardless of fleet operators. So it is not a question of whether trucks shall be maintained in service stations or operators' own shops. It is a question whether, when and to what extent it pays fleet operators to duplicate service station facilities and activities.

The negative concludes that while not denying that self-service in many cases does make for maximum maintenance efficiency in fleet operation, it by no means is justified in the majority of cases, thus making the basic resolution untenable.

More About Self-Maintenance

(*Continued from page* 26)

zation, and this number of trucks, we could get just as good men as the manufacturers' service stations. We could buy sufficient machinery to run the major part of the maintenance work of the same type as the truck manufacturer. In view of the fact that the truck manufacturer's service stations have to make a profit to stay in business, if we could buy the labor and the materials, and the equipment that we had to use at the same money, we could, therefore, save that profit.

In addition to that, we felt—we knew, in fact—that we would get better and quicker service when we could do this work in our own shop than if we sent it to a service station and had to take our turn in having the work done; that we would get the truck back more quickly if we could control the labor than if we sent it to a service station and had to take our turn.

This whole question, even under those conditions, is affected by the type of maintenance. By type of maintenance I mean whether it is the unit system of repair, or the constant inspection system. It has been my experience that the constant inspection system of maintenance is the cheapest kind of maintenance, perhaps combined with the unit repair in some cases, for the reason that you only take out of the vehicle at the time you repair it, as a result of this inspection, those units which have delivered their full life.

●

New Book Covers Ford V-8, B and A Models

A NEW book has recently been published by the Norman W. Henley Publishing Co., 2 W. 45th St., New York City. It is a book that every operator with Ford cars or trucks in his fleet should want, as it is a guide to low-cost operation and maintenance, including repair, of these vehicles.

Here, in plain, non-technical language every part of the car is described; every short cut process; every necessary kind of tool and method of work. More than 300 especially made illustrations actually *show* how things are done. The latest syncromesh transmission is thoroughly explained, also all details of the "V-8" engine. There are hundreds of suggestions for driving and upkeep economies; trouble shooting advice for road and shop, power plant overhauling, quickest ways to locate defects in carburetion, cooling or ignition systems. There are complete lubricating instructions and a thorough description of the new, downdraft carburetor and distinctive "V-8" ignition system.

The general auto mechanic who wants to become a Ford expert will find this book most complete and up-to-date. The fleet owner will find it full of helpful money-saving advice and a friend indeed. There are more than 700 pages, 319 special illustrations and the price is $2.50. Obtainable from the publisher, mentioned above, or from the Book Department, FLEET OWNER, 90 West St., New York City.

●

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EXECUTIVE with practical experience in the automotive equipment field — purchase — repair — maintenance — handling men — seeks connection with reputable firm, any capacity. Moderate remuneration. Address E. W. B., care FLEET OWNER, 90 West St., New York City.

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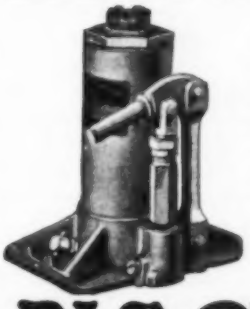

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Two Fuel Tanks Would Lower Fuel Costs?

EXPERIMENTS conducted at the Bureau of Standards have opened up the possibility of using two fuel tanks on automobiles, one to contain a high grade fuel for starting the motor and the other a cheaper grade fuel for running the motor after it warms up.

Dr. H. C. Dickinson says that no designers seem disposed to add this complication to driving, although by this means economies in greater use of low grade fuels might be obtained.

Tests are still being made by the Bureau to determine the most efficient blends of gasoline and alcohol, for automobile fuel. Tests to determine the efficiency of the blends were started some time ago, after several Midwestern members of Congress had advocated legislation requiring the use of alcohol with gasoline in order to remove the agricultural surplus of certain farm products.

●

Safety Advertising Plan Approved

APPROVAL of the safety advertising plan being sponsored by the Eastern Conference of Motor Vehicle Administrators by directors of the National Automobile Chamber of Commerce, was announced recently.

Under the plan, automobile, tire, gasoline and parts and accessory companies will be invited to devote some share of their advertising in newspapers, magazines, radio and billboards to the subject of safety.

The action of the Chamber directors carries with it a recommendation that automobile companies support the efforts of the Commissioners.

Dairy Firm Standardizes on Plymetl

THE Sanitary Farm Dairies of St. Paul., Minn., operate some 75 delivery bodies of the type shown here. As a body material, they have standardized on Plymetl because the use of this metal-faced plywood has provided them with light-weight, strong and sanitary bodies.

Side panels of these particular units are furnished in one piece and are made of ¼" EVE Plymetal. The doors are also fabricated of this same material. Bodies of this kind in this fleet are mounted on both Ford and International Harvester chasses.

●

Some Interesting Fleet Cost Figures

LOWER cost per mile in 1933 for their large fleet of salesmen's cars and trucks, operating in all parts of the country, was forecast in preliminary figures released recently by General Foods Corporation, 250 Park Avenue, New York City.

This firm's fleet of 1,007 cars rolled up a total of 15,735,754 miles in 1932 at an average cost per car mile of 4-9/10 cents. Indications are that when 1933 figures are compiled, General Foods' fleet will have traveled approximately 15,335,000 miles at an average cost per car mile of 4-3/10 cents—an anticipated reduction of 6/10 cents a car-mile. The company's mileage costs, it is pointed out, include all operating and maintenance costs, as well as the fixed charges of license, insurance, and depreciation.

Actual figures for the first nine months of 1933 show a total fleet mileage of 11,313,086, and a car-mile operating cost of 4-1/3 cents. This compares with 11,644,326 miles at an operating cost of 5 cents a car-mile for the same period in 1932. Better cars, tires, gasoline, oil, roads, and service facilities are given full credit by C. L. Jones, head of General Foods automotive division, for reduced mileage costs, 1933 being the third year to record such decreases.

"Tire costs provide an interesting item in our records," states Mr. Jones. "In 1927 our tire costs averaged 8/10 cents a mile," he says—"including both new tires and repairs on old equipment. In 1929, improvement in tires and lowering in price were reflected in a tire cost of 4/10 cents a mile—just half what it had been two years before. Then in 1931 our tire mileage cost dropped to 3/10 cents. For the first nine months of 1933, our tire mileage cost was comfortably under 2/10 cents, although for the full year of 1933 we expect it to average about 2/10 cents a mile.

Anticipated reduction of 400,000 miles in total fleet mileage in 1933 is attributed to better routing and reassignment of salesmen's territories. The company's fleet includes 323 coupes, 467 sedan deliveries, and 217 ½-ton panel deliveries, nearly all of which are on 6-cylinder chasses.

Some Interesting Snow-Removal Experience

HIGH up in winter's stronghold the maintenance forces of the Bureau of Public Roads clear the snow from Berthoud Pass in Colorado on the transcontinental highway. An account of how annual snowfalls of 40 feet are handled on the 30-mile section of road through the Arapaho and Clear Creek National Forests across the Continental Divide was given in a talk by C. E. Learned of the Bureau of Public Roads before the recent Highway Conference in Boulder, Colo.

Prevention, control and disposal are the three methods of handling snow to keep the highway open to traffic during the winter. Roads are elevated to encourage wind sweeping, snow fences are erected to catch drifts and many other methods of prevention and control employed. But the interesting and exciting work, says Mr. Learned, is the snow fighting with plows.

The snow falls are so heavy that as the road is cleared with push plows on the front of heavy trucks, the mounds of snow at the sides of the road accumulate to depths as great as ten feet. Then the snow is pushed into a windrow parallel with and near the outside mound and a rotary plow is used to throw the snow 50 or more feet away from the road. On two occasions in the last two years, equipment has been worked night and day for three weeks, stopping only to grease, oil and refuel.

Snow fighters are picked carefully from the men in the regular highway maintenance organization for this annual battle with drifts of snow that rival those of the Alps. These men are familiar with the road, are physically able to endure the long hours of work and the discomforts of battling a blizzard, and can be depended upon to be courteous to the traveling public.

The economy of keeping Berthoud Pass, 11,306 feet high, open to traffic, without considering the convenience of the public, is estimated from gasoline tax revenue. With 53,000 vehicles using the Pass during the eight months in which it would be closed but for the snow-fighting operations, the gasoline tax alone represents an income of at least $25,000, which is considerably more than the cost of snow removal necessary to keep the highway open.

●

Tire Information for 1½-ton Trucks

"AS a general rule the proper size of tire reduces the tire cost per mile of operation to a point where it is no longer a source of concern to the ordinary operator. It is impossible to overlook the savings which may be effected from the use of the proper size of tire on one and one-half ton trucks.

"At the present time there are more trucks in the one and one-half ton classification than all others combined."

So declares a four-page booklet "A Practical Guide For Tire Combinations on 1½ Ton Trucks" just published by The B. F. Goodrich Rubber Company, Akron, Ohio, and available upon request to the manufacturer.

The booklet includes a table to be used as a Change-over Guide for 1½ Ton Trucks, giving the payload in pounds, tire size, rim size and dual spacing in inches for both the 131 and 157 inch wheel base, and illustrates the application of single tires, proper dual spacing, and dual installations.

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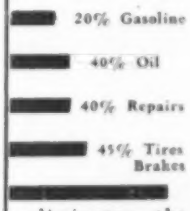

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In most cases, these same jobbers also have available Double Diamond Mated and Lapped Drive and Pinion Gear Sets, which are also built to finest original equipment standards. For satisfactory service, for economical installation, and for convenience . . . standardize on Double Diamond for your axle shaft and gear requirements.

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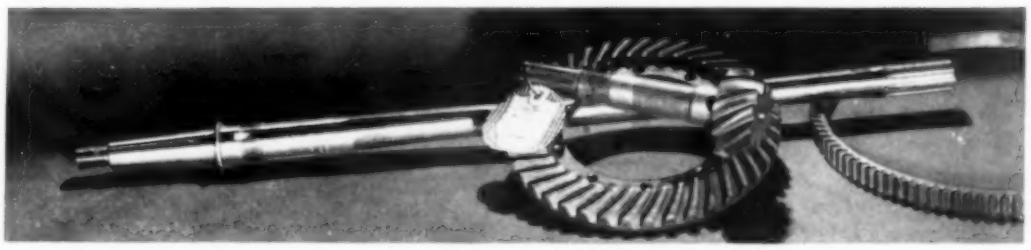

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